HITCHCOCK'S

wood working digest

PARTNERS WITH THE INDUSTRY FOR MORE THAN 60 YEARS

SEPTEMBER · 1960

SCIENCE

JOHN G. ROBINSON
Bowater Board Plant Manager

Exclusive Interview

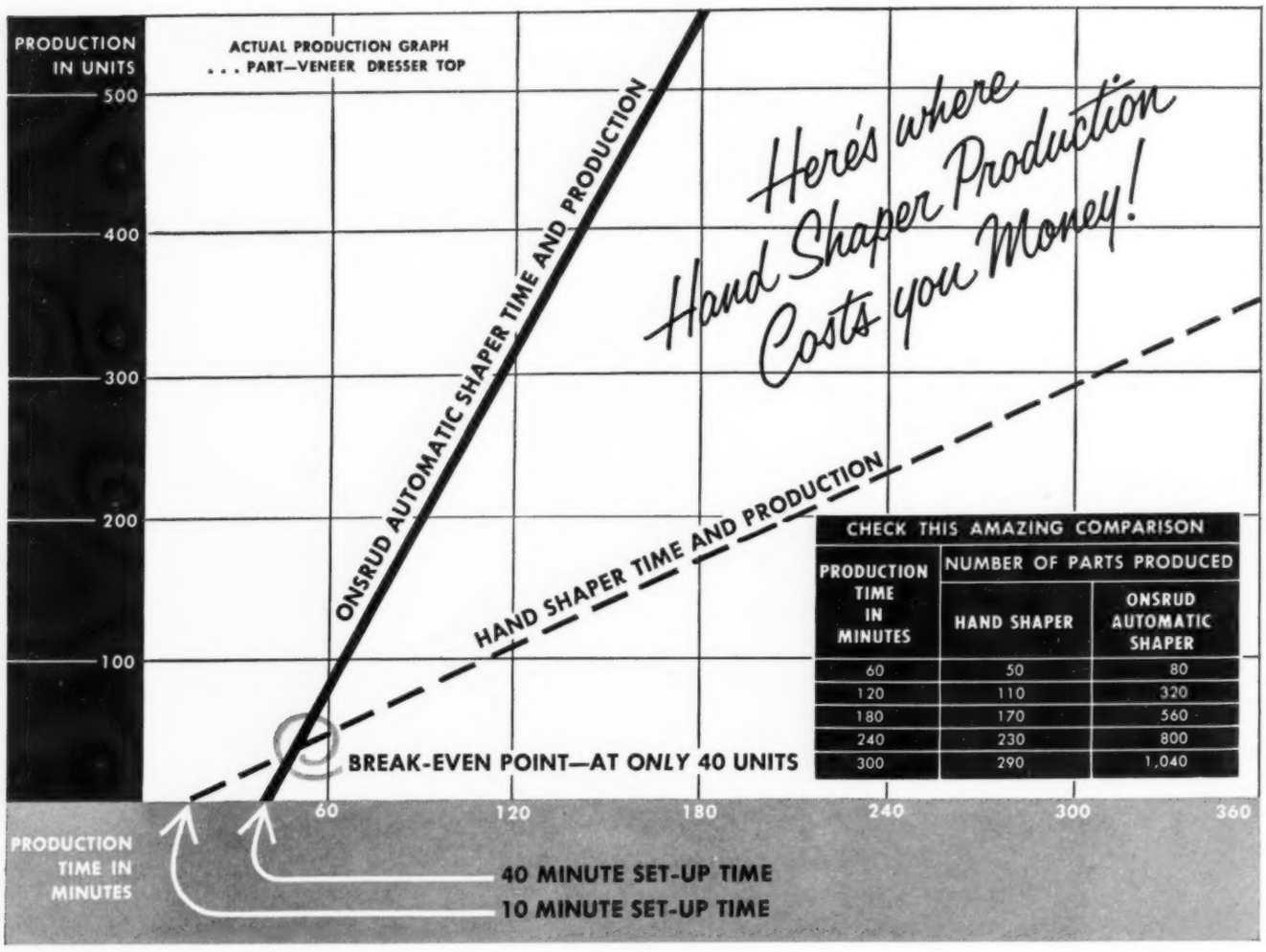
NEW AIR-PROCESS HARDBOARD tailored to your production needs

Part I

Serial Dept.

Also in this issue

Double-End Tenoner—Part III
Unusual Nash Book Review
Fire-Retardant Paint



CHECK THIS AMAZING COMPARISON

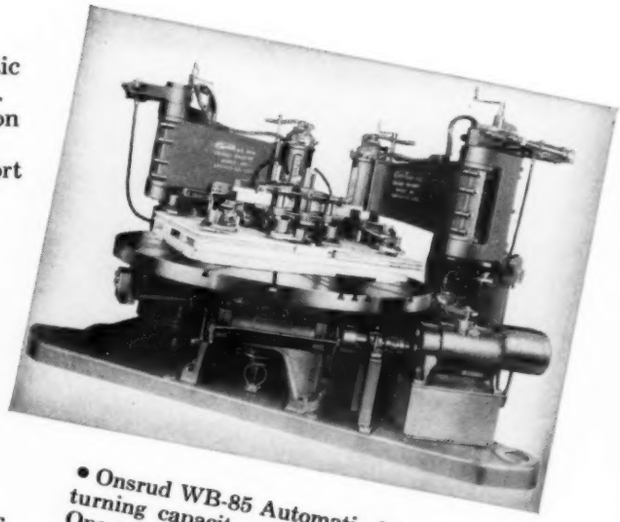
PRODUCTION TIME IN MINUTES	NUMBER OF PARTS PRODUCED	
	HAND SHAPER	ONSRUD AUTOMATIC SHAPER
60	50	80
120	110	320
180	170	560
240	230	800
300	290	1,040

This is how you may be paying for an automatic shaper now... so why not have one?

Here's proof of how Onsrud Automatic Shaper production pays for itself . . . and how slow, hand shaper production costs you more than the price of an Onsrud Automatic. Note too how short a run may be, to be practical for an Automatic. When you consider the fact that an Onsrud Automatic Shaper with only ONE operator, will out-produce three hand shapers with *three* operators, the money you can save becomes tremendous.

YOU HAVE EVERYTHING TO GAIN AND NOTHING TO LOSE

Let us make a production study of your plant. We'll recommend an Onsrud Automatic Shaper to fit your needs and GUARANTEE production. If you then accept this machine and if it does not perform as guaranteed we'll take it back without cost to you. We cordially invite your inquiry for complete information.



• Onsrud WB-85 Automatic Shaper with 85" turning capacity . . . one of several models. Operating features include smooth work requiring little or no sanding . . . and cutting, free of chatter marks.

ONSRUD MACHINE WORKS, Inc.

Woodworking Machinery Division • 7742 Lehigh Ave. • Niles 48, Ill.

AUTOMATIC SHAPERS, ROUTERS, SHAPERS, CONTOUR PROFILERS, FINGER JOINT SHAPERS, PORTABLE TOOLS AND RELATED EQUIPMENT FOR WOODWORKING

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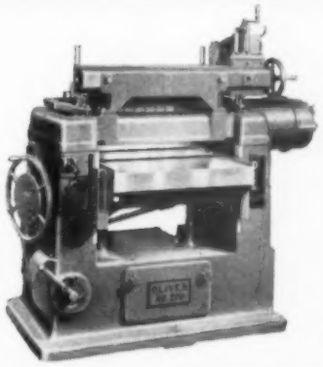
look to the extensive **OLIVER** line of fine woodworking machinery for dependable, efficient performance

"OLIVER" No. 381 Heavy duty, oscillating Single Spindle Sander and Metal Grinder. Available with power tilting feature, operated by foot control. Dial at right indicates degree of tilt. This machine is rigidly built to provide low cost operation with high efficiency. It's durable; stands up under the most adverse conditions.

Other "Oliver" Sanders offer wide selection in size and style.

"OLIVER" No. 299 — 24" Surfacer to give 15 to 60 f.p.m. of mirror smooth planing. Planes stock up to 24" wide, 8" thick, as short as 11". Circular safety type cylinder, 3-knife standard, 4½" cutting circle. Sectional chipbreaker, sectional infeed roll and permanently located knife grinding and jointing attachment. All controls located in front of operator.

Other Surfacers from 18" to 36" capacity.

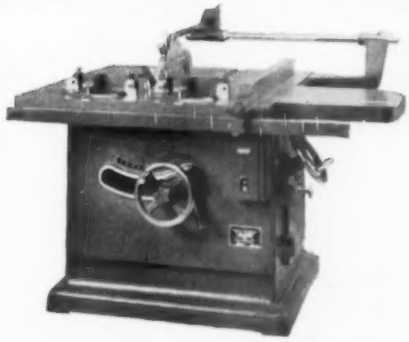


"OLIVER" No. 94-DH Hydraulic 'Straightline' Cut-Off Saw

Suspended accurate link motion guarantees perfect straight line operation. Machine carries saws from 14" to 20" in diameter. Operates at high production rate. Saw with its guard is housed inside of main column when not in use. At touch of operator's finger, stock is cut, then saw automatically returns to original position without rebound.

"OLIVER" No. 88 Tilting Arbor Miter Saw — Finest accuracy, maximum safety. Fine engineering combines accuracy, convenience and safety. Base and baffle plates encase lower part of saw, assure safety . . . adjustable splitter prevents pinching of work after cut . . . overhead cage guards top of saw in tilted positions. Up to 18" diameter saw size . . . miters and dadoes at square or any angle to 45 degrees.

Wide variety of types and sizes in "Oliver" Saws



OLIVER MACHINERY COMPANY

Circular Saws, Band and Jig Saws, Surfacers, Jointers, Lathes, Sanders, Borers, Pattern Millers, Mortisers, Tenoners, Shapers, Moulders, Carvers, Grinders, Wood Trimmers

WOODWORKING MACHINERY

Grand Rapids 2, Michigan

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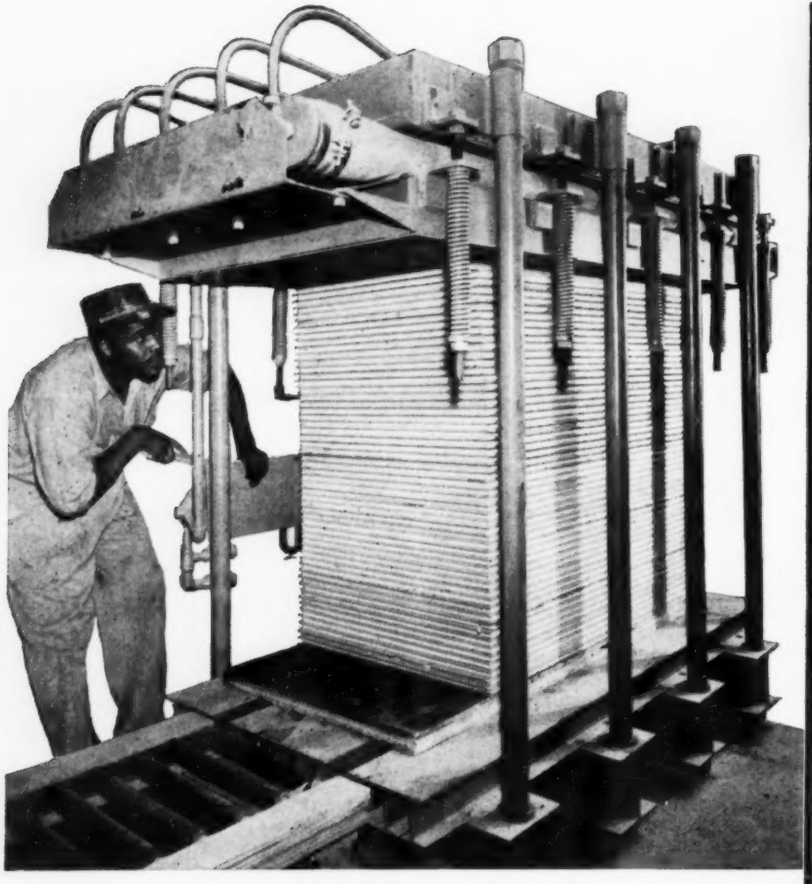

FOUR ANSWERS TO YOUR LAMINATING PROBLEMS

We've taken your production problems . . . and designed machines to answer those problems. In hundreds of progressive plants throughout the world, the four presses shown here are the basis for modern production techniques in moderate pressure bonding operations. Perhaps one of these job-engineered presses will answer your laminating problem. The specific product bulletins will give you more detailed information. Write for them today!

AIR HOSE LAMINATING PRESS—BULLETIN 11-D

For cost-conscious manufacturers—a high production press for moderate pressure bonding with vinyl and other adhesives. Platen size 30" x 30" to 62" x 120".

ROTARY PRESS—BULLETIN 11-C

The ideal press to laminate dissimilar plies when bonding with *rubber base instant contact bond adhesive.* Roll widths to 134"; pressing speeds 10 to 60 FPM; Max. pressure 12,000 lbs.

MOTORIZED LAMINATING PRESS—BULLETIN 11-E

A rugged and dependable laminating press for use with all kinds of cold glue. It's especially popular for laminating composition board, flush doors and plastic laminates and can be used with or without retaining clamps. Capacities 36" x 36" to 48" x 120".

HYDRAULIC LAMINATING PRESS—BULLETIN 11-P

Preferred for laboratory, experimental and light production work. Standard sizes from 1 to 12 sq. ft. Pressures to 100 tons.

THE BLACK BROTHERS COMPANY, INC.

MENDOTA 6, ILLINOIS

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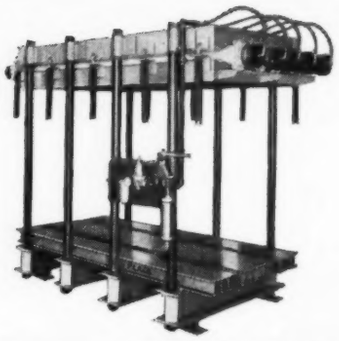
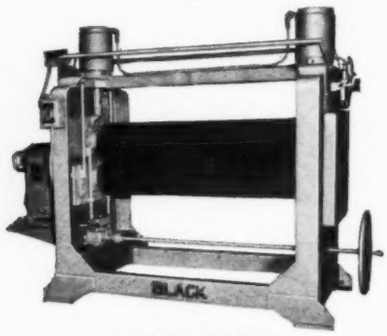
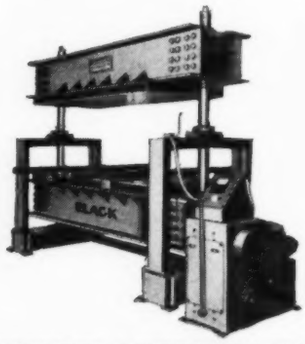
BLACK BROTHERS COLD PRESSES



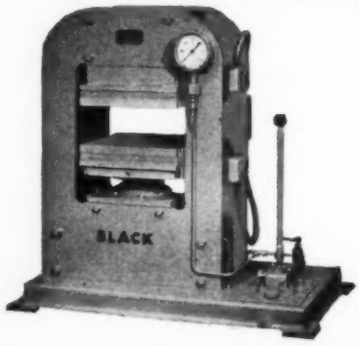
AIR HOSE LAMINATING PRESS



ROTARY PRESS



MOTORIZED LAMINATING PRESS



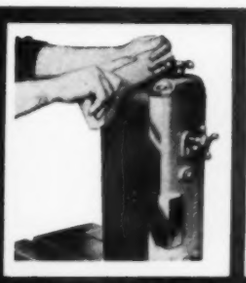
HYDRAULIC LAMINATING PRESS

THE NEWEST IN A LONG LINE OF FINER MACHINES

MODEL 30
Belt and Disc Sander

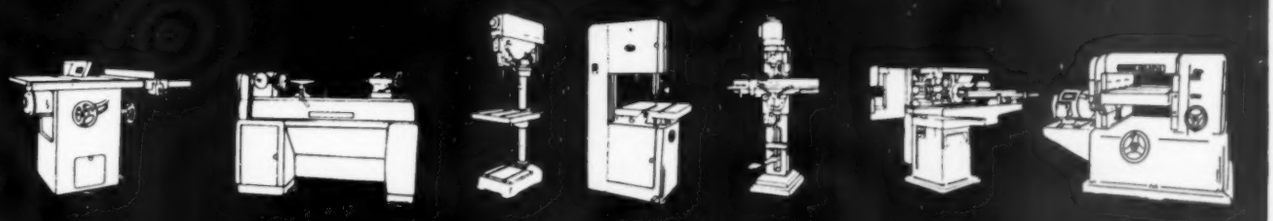
Powermatic ingenuity and engineering now brings you the multi-purpose sanding and polishing machine flexible enough for every job in your shop! Use it accurately for all contour, angle and bevel sanding on woods, plastics and similar materials . . . use it for de-burring and burnishing metal jobs! Big capacity, simplified operation and extra ruggedness at an unusually low cost.

Easy beveling . . . table tilts 45° out and 20° in on heavy-duty trunnion.



Contour sanding is simple . . . just tilt belt unit vertically!

Optional tilting fence tilts 45° right for super-finish edge angle sanding!



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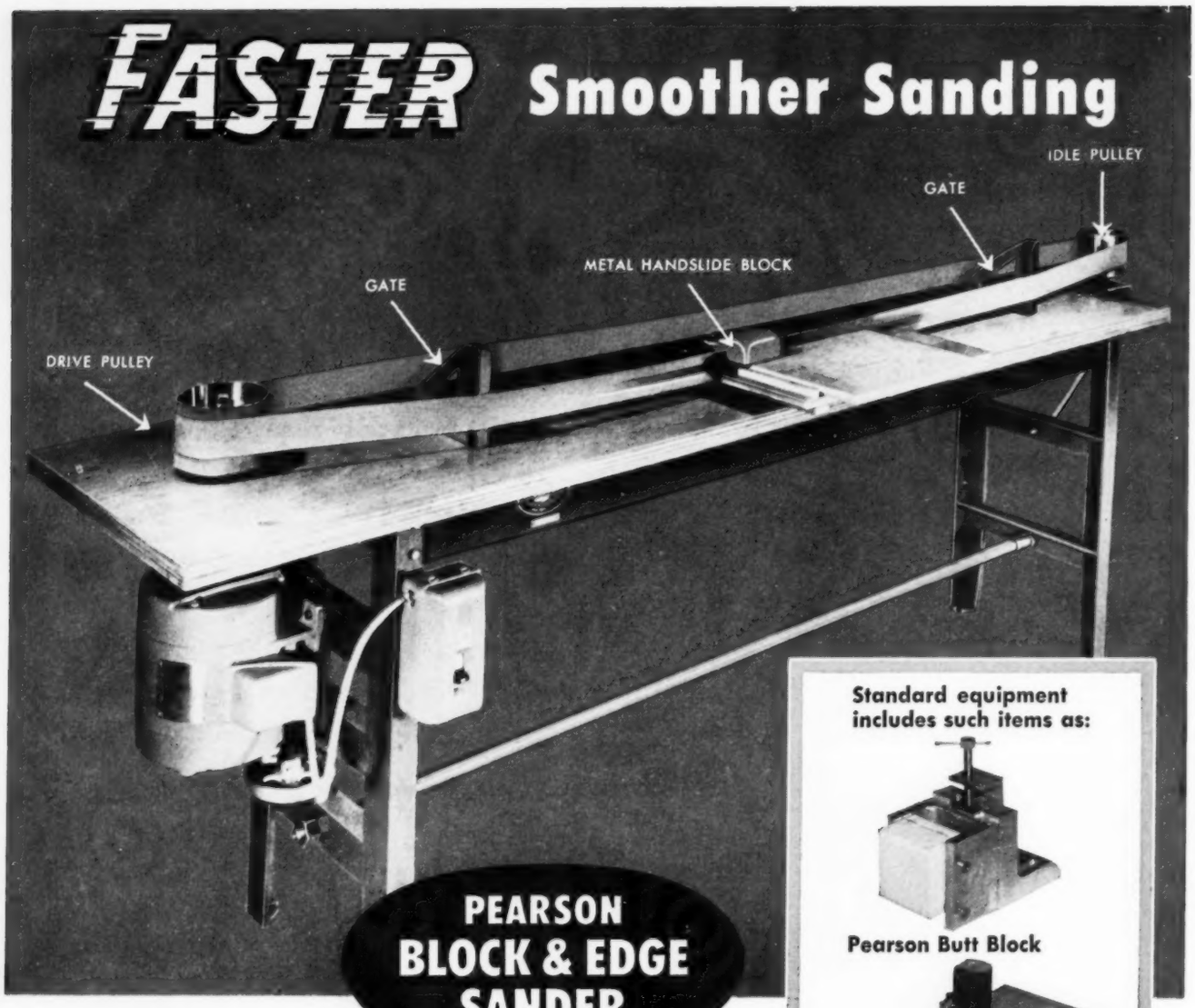


PEARSON BLOCK & EDGE SANDER

Standard equipment includes such items as:

Pearson Butt Block

Form Block Holder with Steel Plate

—also all parts identified on photo of the machine above. Complete specifications sent on request.

Pearson Hand Slide Block

With each machine, customer receives either a Pearson Hand Slide Block, made to any mould, or felt block, shaped to any mould, to be used with the Pearson Butt Block.

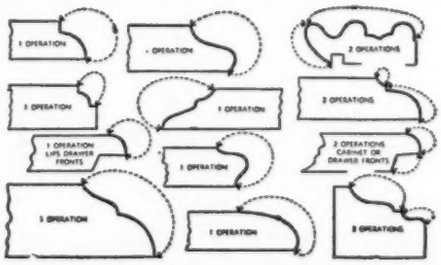
Today you must be able to produce the finest surface at lowest cost to meet competition. This is the machine you should have! Sands straight mouldings, straight and round corners—all in one simple operation. Can also be easily converted to upright spindle sander. Equipped with 3 h.p. motor for five types of sanding—stationary mould block, hand slide block, curved edge, straight edge and spool (all types of curves). Pearson patented heads fit motor spindle. Write for details.

HERE ARE TYPICAL SHAPES WHICH CAN BE SANDED PERFECTLY!

These are but a few of the shapes that can be sanded perfectly with the exclusive Pearson Hand Slide Blocks. The form is lined with high-speed babbitt for longer life. Blocks are for straight mouldings only.

WE SELL DIRECT!

This enables us to personally instruct your operators to get maximum efficiency from the machine.



We also manufacture the well-known Pearson Model "A" Spindle Sander!

PEARSON SANDING MACHINE CO., INC.

HIGH POINT, NORTH CAROLINA

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HITCHCOCK'S
wood working digest

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BPA

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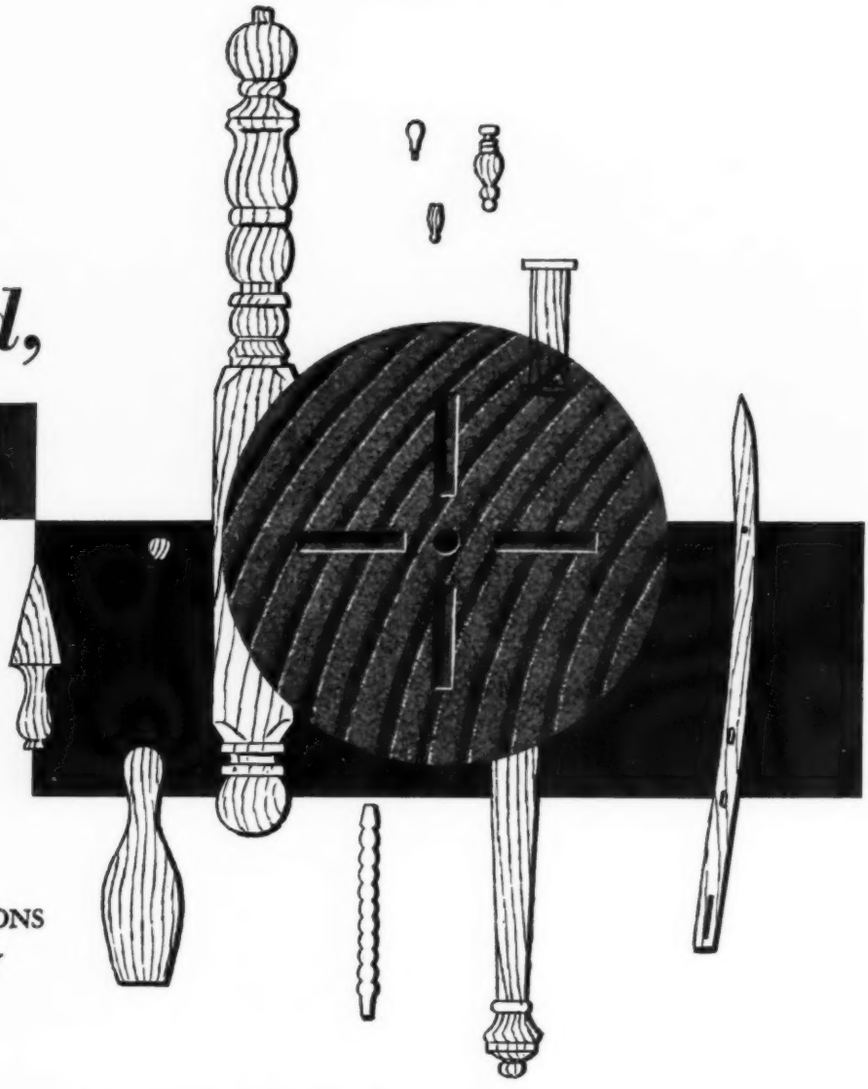
If it's turned,

NASH

can sand it!



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- ENJOY PRECISION UNIFORMITY
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- PRODUCTION WITH NO SACRIFICE IN QUALITY

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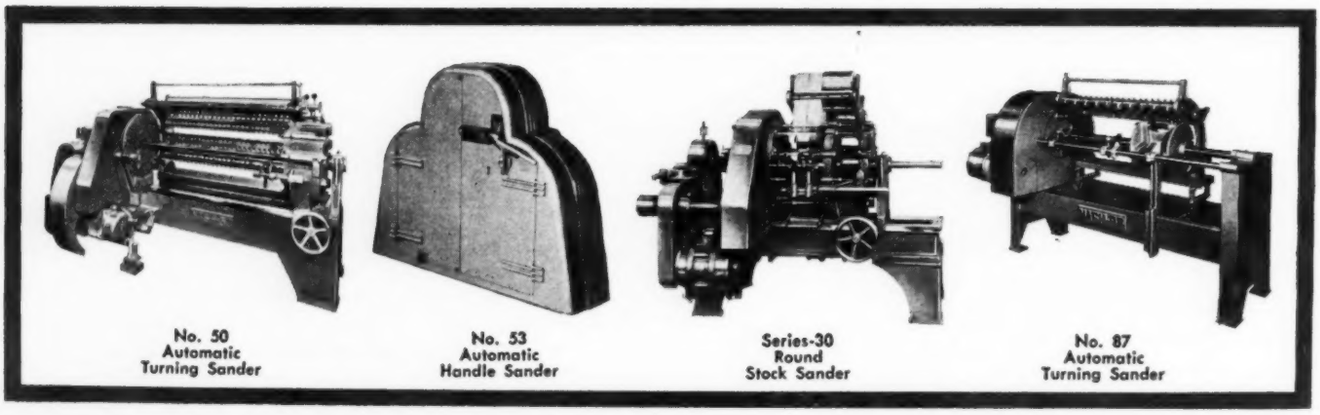

No. 50 Automatic Turning Sander

No. 53 Automatic Handle Sander

Series-30 Round Stock Sander

No. 87 Automatic Turning Sander

Nash can supply sound solutions to your sanding problems with either standard or custom-designed machines. For complete information and descriptive bulletins, write:

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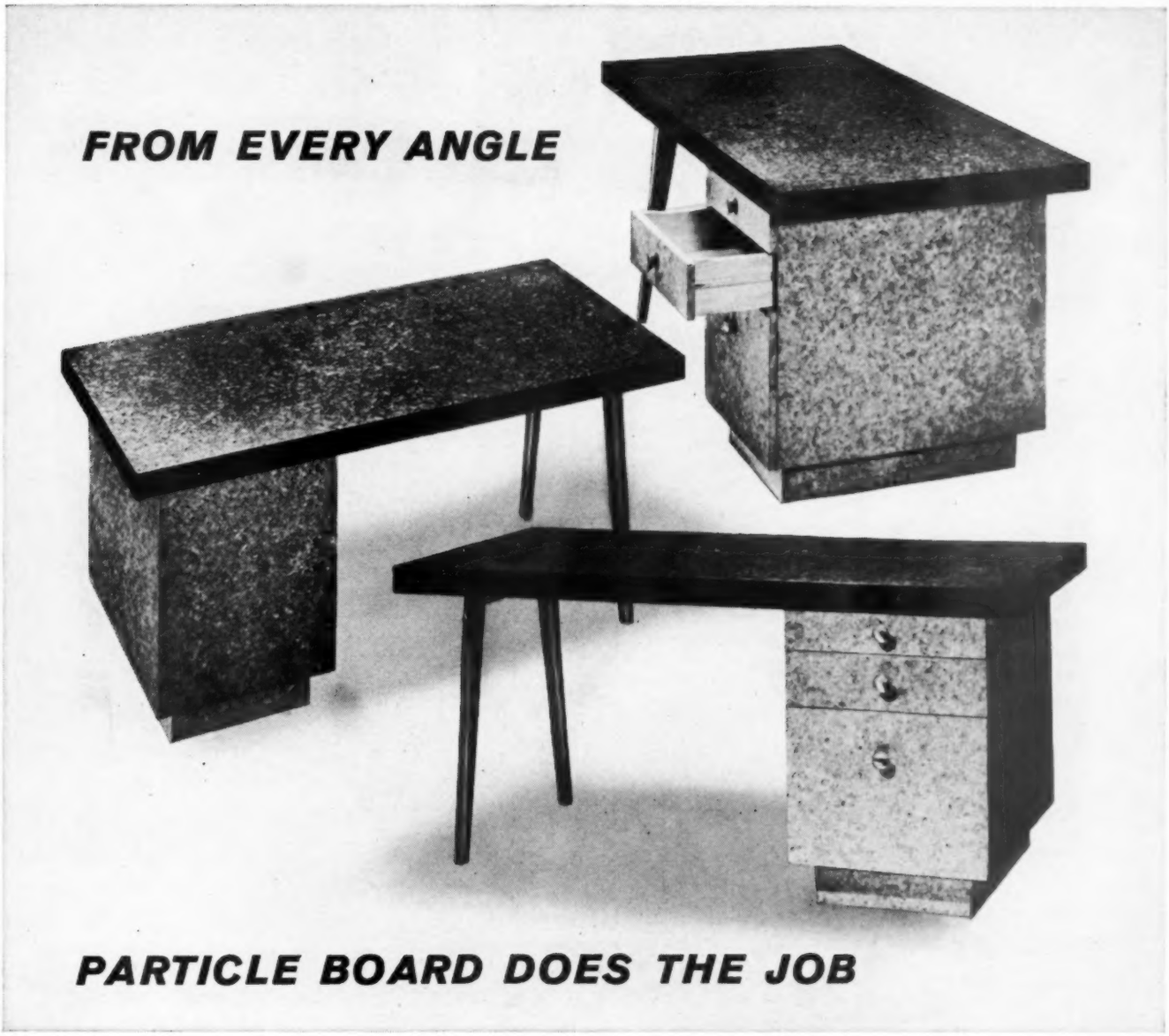

A Versatile Furniture Material

• The trend today is toward wider application of particle board in furniture manufacture.

Particle board is actually better than the wood of which it is made. It's tougher, harder, more versatile . . . free of grain, knots or weak spots. It's easily machined, holds screws better than lumber, and adapts easily to laminating and veneering processes. Successful uses of particle board in furniture today include cores, drawers, backing and decorative surfaces.

These and other applications point to an increase in usage that places added importance on the adhesive chosen to bond the wood particles securely together: it must be of consistently high quality to insure dependable, uniform strength in the finished board.

Reichhold can fill all your regular and special glue needs from a practical range of urea-formaldehyde, phenol-formaldehyde, and polyvinyl acetate adhesives. When you do business with RCI you can also count on these invaluable extras . . . fast, reliable delivery all over the country and expert technical aid when you need it.

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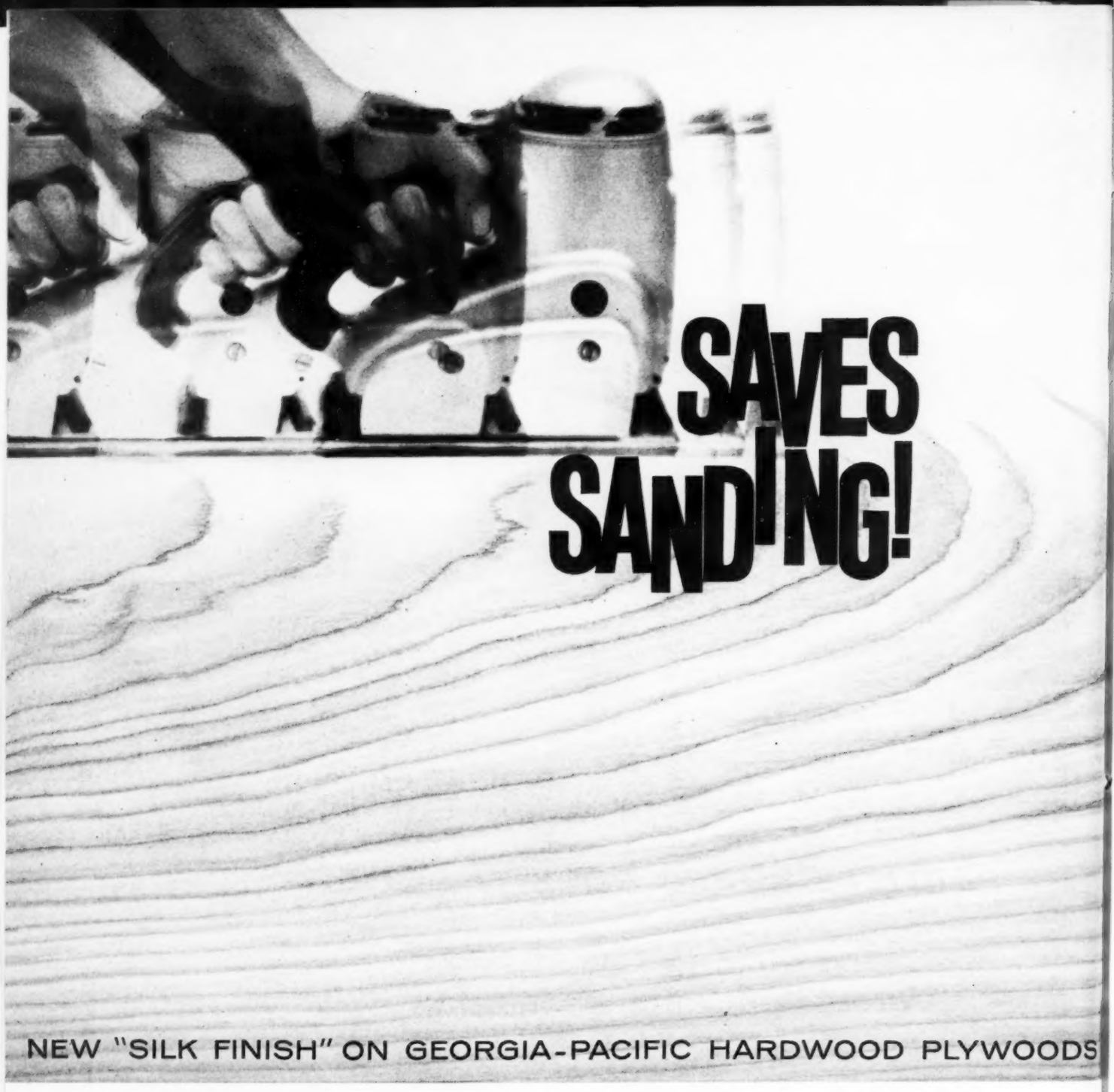

—cuts your costs yet costs no more. You start with a super-smooth surface free of fibers, snake tracks or swirls. Over 90% of the sanding you usually do is already done by G-P's special high-speed machines. You can order this fine furniture finish on Hardwood and Decorative Plywoods from Georgia-Pacific. "Silk finish" comes in a wide range of faces: Ash, Birch, Cedar, Cherry, Elm, Fir, Gum, Limba, Madrone, Mahogany, Maple, Oak, Pine, Redwood, Rosewood, Teak, Walnut. All standard sizes in thicknesses from 1/8" through 3/4"... or custom-made to specified sizes and faces.

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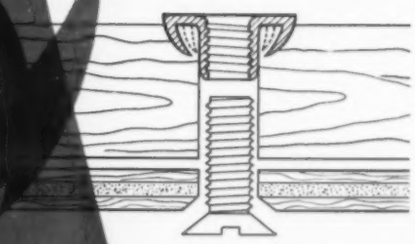
6 NEW prong TEENUT®



Note how prongs toe-in after Teenut is driven into hole. Toe-in action plus multiplicity of prongs increases push-out resistance far beyond that of other pronged fasteners.

BOOTH #9
South Exhibition Hall
N.A.F.M. Show

gives you greatly increased push-out resistance

Here's an easily concealed threaded fastener that's built like a miniature bear-trap . . . with six claw-like prongs that penetrate, toe-in and grip so tight you really have to pound it to back it out of its hole.

With the new 6-prong Teenut, you'll cut your rejection rate and eliminate that old problem of the "lost fastener" . . . because this is one pronged nut that stays where it's put.

Full engineering details and prices on request. Currently available in the following sizes: 8-32, 10-24, 10-32, ¼-20, 5/16-18.

CARR FASTENER COMPANY
Division of United-Carr Fastener Corporation, Cambridge 42, Mass.

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Offices in: Atlanta, Boston, Chicago, Cleveland, Dallas, Detroit, Kalamazoo, Los Angeles, Louisville, New York, Philadelphia, Syracuse

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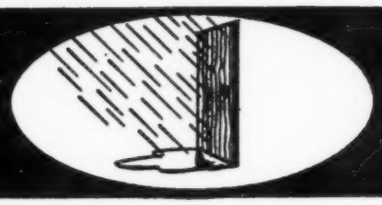

. . . . with PERKINS 8523 CASEIN GLUE

Perkins 8523 Casein Glue, a blend of several adhesive materials, offers manufacturers of flush doors an opportunity to speed up production and increase water resistance at a lower glue line cost!

The formulation also offers advantages in other panel-to-frame gluing operations as well as in veneering and in laminating.

With Perkins 8523, pressure periods of up to one hour are sufficient. Overnight stacking is recommended for best results but less time is possible where necessary.

The glue line complies with the two cycle soak test called for by Commercial Standard CS 171-58 as well as the Type II and Type III requirements of CS 35-56. Actually, the bonds obtained with the Perkins 8523 formulation have given far better results than the Commercial Standards require.

The mixed glue cost of the formulation is much lower than that of other glues with fast set and high water resistance, representing a considerable saving to most glue users. It has a pot life of 6 to 8 hours, depending upon room temperature. Storage life of the unmixed Perkins 8523 is from three to five months.

It should be emphasized that Perkins 8523 is not an ordinary casein glue. It is a carefully prepared blend of casein with other materials having desirable adhesive properties.

Samples of the formulation are available for your tests or the Perkins service representative in your area will be glad to conduct a demonstration in your plant to prove the advantages you can obtain with Perkins 8523.

PLANTS IN LANSDALE, PA.; SHAWANO, WISCONSIN; HIGH POINT, N. C.; WEST MEMPHIS, ARK.; KITCHENER, ONTARIO and LA CHUTE, QUEBEC

PERKINS GLUE COMPANY

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NOW!...JOINT ONLY HALF AS OFTEN WITH SIMONDS NEW *SI-CLONE* THIN PLANER KNIVES

New Premium Grade Steel at Regular Prices

Here, for the first time in many years, is a startling new development in Thin Planer Knives.

Simonds New Si-Clone Knives are made from a brand new kind of steel, developed by Simonds metallurgists. They not only stay on the job far longer than regular knives — *but require jointing only half as often!*

Tougher, more abrasion resistant, these new Si-Clone Knives have exceptional edge-holding qualities. They handle knots easily and produce a more uniformly smooth surface. And work equally well in all types of timber and any planer head location.

Furnished in perfectly balanced pairs, Simonds New Si-Clone Knives are now available in all popular sizes from your local Simonds Distributor's stock. Try them and see the money-saving difference.

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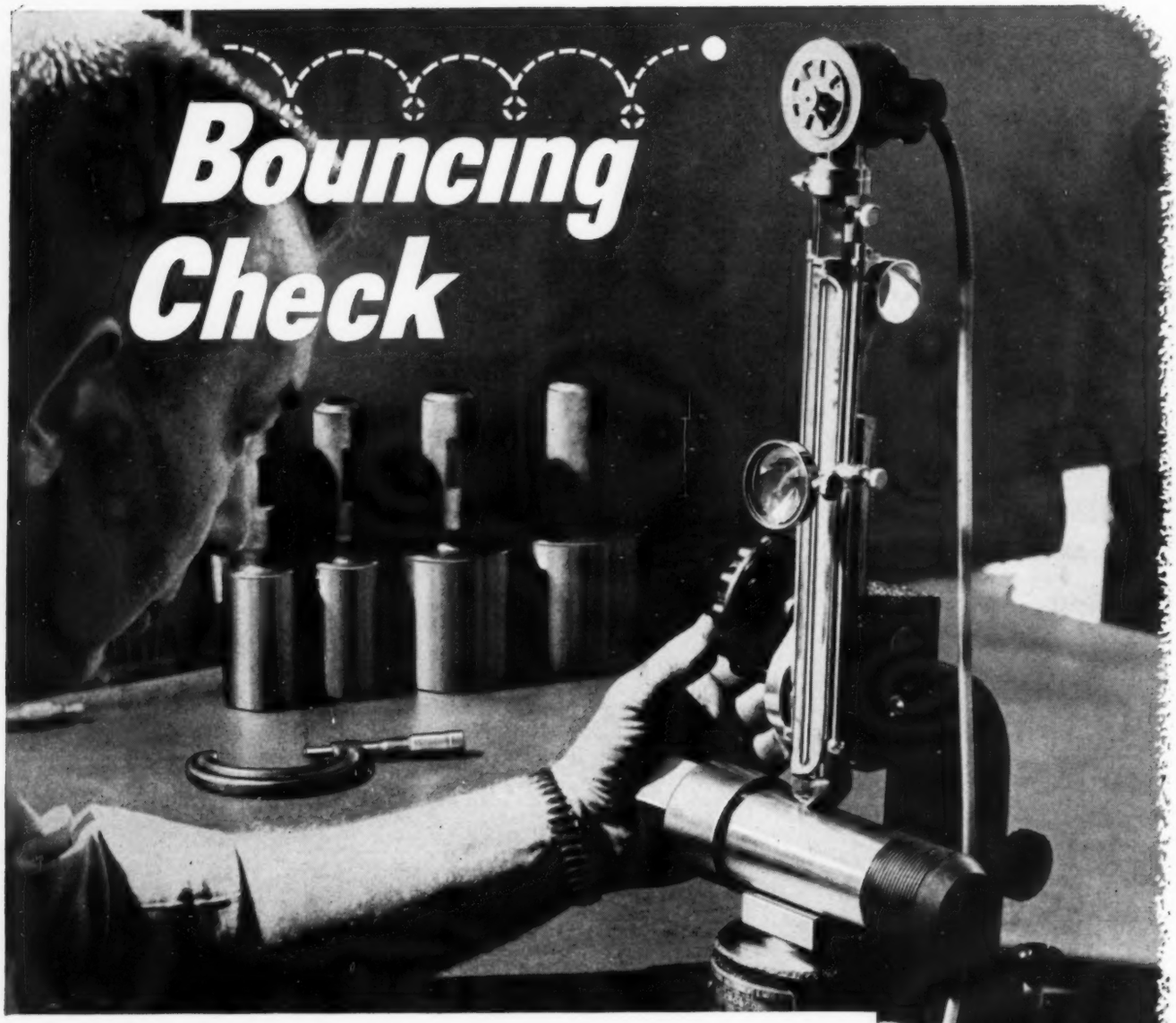


A "rubber check" or one that "bounces" may constitute a real problem to the banker or the person who cashes it.

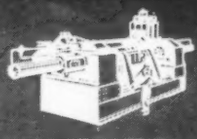
In our factory we find a different kind of bouncing check to be of value in determining the hardness of important parts in which resistance and toughness are essential.

Starting with HYTEN A1X, a top manganese-moly steel alloy, these shafts are Rockwell prick punch tested for hardness through the heat treating operations.

But this method cannot be used after machining and grinding operations because of possible damage to the finish.

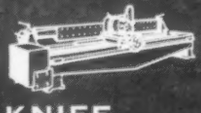
Final checks are made by means of a Scelerescope, one of which is being used in the photo above by Bob Huff in our control department. This advanced instrument indicates hardness by means of a bouncing steel ball inside of a calibrated glass tube.

Such care in details is essential in building fine machines, a fact we have learned through many years of experience. That is why you get more in a Coe machine in which . . .



LATHES

CLIPPERS



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The new wood formed board

Duraflake

Helps you manufacture the best... faster and at lower cost.

Provides maximum Internal Strength and a Smooth, Flawless Surface

Duraflake is ideal for today's furniture. It is superior to other available boards.

The surface is smoother than other boards, eliminating the need for cross banding before overlaying. It is stronger because it is ingeniously formed. This new board has exceptional machining and screw holding properties. It is easy to work and handle.

Duraflake is the practical, superior wood formed board that will increase the quality and add value to your product. It will save you time and money throughout your manufacturing process.

Wood Fibreboard Company

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These are Duraflake's Superior Features:

Fine surface eliminates telegraphing.
Excellent screw holding properties.
Strong internal bond.
Maximum dimensional stability.
Tight core for outstanding edge and face cutting.
Machinability.
Superior modulus of rupture.
Uniform density.
5′ x 16′ press for great latitude.
Teco quality control.

Mail coupon today for Duraflake brochure or informations on specific application:

Wood Fibreboard Co.
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Albany, Oregon

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Please send me a sample of Duraflake and specific information on its use in _____

Name _____

Street _____

City _____ Zone____ State_____

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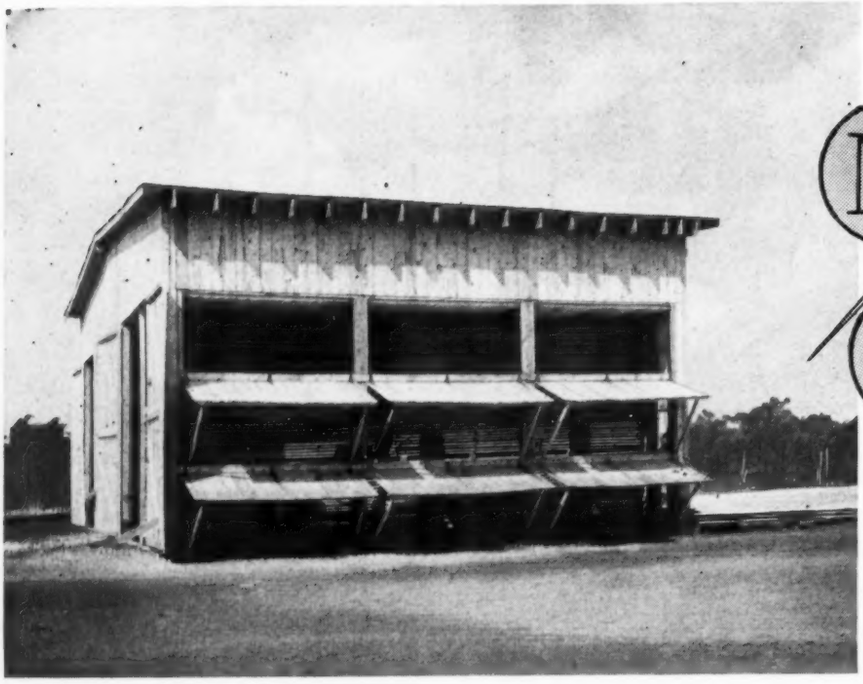

MOORE MODERN METHODS

Low-cost Moore Forced Air Dryer at George F. Strother Lumber Co., Athens, Ga.

The MOORE FORCED AIR DRYER

Turns Inventory Faster–
Holds Degrade to Minimum

Moore Modern Methods and the Moore Forced Air Dryer combine to give you a low-cost plant for seasoning pine and hardwood to air-dry moisture content.

The Moore Forced Air Dryer produces brighter, flatter lumber with less degrade and dries faster than yard drying. The pre-dryer at George F. Strother Lumber Co. has large side flaps to allow maximum ventilation and utilizes supplemental heat when needed.

The Moore Forced Air Dryer is designed for loads on rails or unit packages — portable or permanent construction — capacities from 5,000 board feet and up.

Write today for an estimate on a Moore Forced Air Dryer to fit your layout.

- Dry Kilns (Track and Unit Package)
- Direct Heat Kilns
- Forced Air Dryers
- Cabinet Dryers
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- Cross-Circulation Veneer Dryers
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MOORE DRY KILN COMPANY

JACKSONVILLE FLORIDA | BRAMPTON ONTARIO | VANCOUVER BRITISH COLUMBIA | NORTH PORTLAND OREGON

World's Largest Manufacturers of Drying and Handling Systems for Lumber and Veneer

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Importance of Forest Products Recognized as Bill Passes U. S. Senate

Support and acceptance for National Forest Products Week was given another big boost last month when Senator John L. McClellan (Dem., Arkansas) introduced in Congress a joint resolution, S.J. 209, providing for the establishment of the annual observance of National Forest Products Week.

The resolution was received, read, and following the regular procedure of the Senate, referred to the Committee of the Judiciary, which schedules upcoming legislation of this type to be presented for Senate debate. In the record time of four days the resolution cleared the Committee, was presented on the floor of the Senate and passed. The joint resolution must now go through the same procedure in the House of Representatives before it is sent to the President.

Early House Approval Sought

Every attempt is being made to obtain House consideration for the bill when Congress reconvenes in early August. In this regard, all lumbermen and those connected with the lumber industry are being urged to write directly to their congressional representatives expressing support for Joint Resolution S.J. 209.

In presenting the resolution, McClellan made the following remarks which were published in the Congressional Record:

"Mr. President, the oldest industry in the United States, the Forest Products Industry, deserves the public recognition of a special week set aside for the observance of a celebration honoring that industry.

"It will be to the best interests of the people of this nation, including government, labor and management to have the forest industry called to their attention annually through the proclamation of a National Forest Products Week. The passage of this joint resolution by the Congress will insure proper and deserved recognition of this vital industry in our national economy."

F.P.R.S. Mid-South Section Meeting Scheduled

The Mid-South Section of the Forest Products Research Society will hold its annual meeting from September 28th to October 1st at the Parkview Hotel in Memphis, Tennessee.

"Research for Wood's Survival in the Market Place" will be the topic discussed at the technical sessions with James R. Welsh, founder and Ex-President of Welsh Plywood Corp., Memphis; Fritz Deane, President of Nelsonite Chemical Products Company, Grand Rapids, Michigan; Art Cleveland, Manager of Dover Elevator Corporation, West Memphis, Arkansas; W. D. Page of Plywood Fabricators Service, Chicago; Carlton Smith,, President of Fan Air Drying Systems, Memphis; and W. J. Eason, Vice-President of Nickey Brothers, Inc., Memphis, and Past President of the Forest Products Research Society as speakers. Plant tours will be made on September 30th of Nickey Brothers, Inc., Forest Products Chemical Company, and United Wood Corporation.

For entertainment a "Lufthansa Night" party is planned for the 29th with food and service provided and supervised by the Lufthansa personnel who were present on the F.P.R.S. chartered flight.

NHLA Convention To Hear Commander of U. S. Rocket And Missile Agency

Hardwood men and their ladies attending the 63rd Annual Convention of the National Hardwood Lumber Association in Chicago, October 4-6, will be treated to a most interesting and timely program of informative speeches, important business sessions and a full calendar of social events. The three day meeting will be held at the Sherman Hotel. "We feel we have arranged a balanced program that will appeal in some way to every one of the fifteen hundred delegates attending," Secretary-Manager M. B. Pendleton commented.

A highlight of the first morning's program will be an informative talk by Col. J. G. Zierdt, Commander of the U. S. Army Rocket and Guided Missile Agency, Redstone Arsenal, Huntsville, Ala. It is under his supervision that our many rockets and missiles are originated and manufactured in part. From this famous installation have come the planning of many of our most successful missiles such as the Nike-Ajax, Nike-Hercules, Nike-Zeus, Mauler and Hawk, to mention a few.

Topics of great interest to lumbermen will be presented by Mortimer Doyle, Executive Vice President of the National Lumber Manufacturers' Association; Les McKimmie, a member of Hoo Hoo's Supreme Nine; Dr. Edward G. Locke, Director of the Forest Product Laboratory; H. F. Staniforth, president of the Canadian Lumbermen's Association, and L. L. Cunningham, nationally known inspirational speaker on business and sales management.

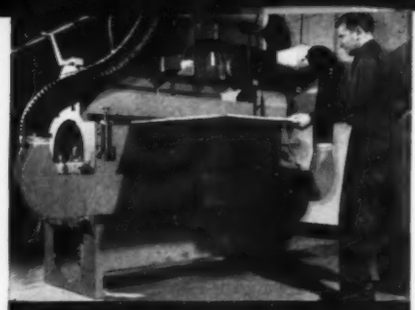
The report of the Rules Committee and the voting on its recommended rules changes will take place on Wednesday, October 5. Reports from the President, Secretary, the Training School Director and the election of a president, third vice-president and slate of directors will round out the business part of the program.

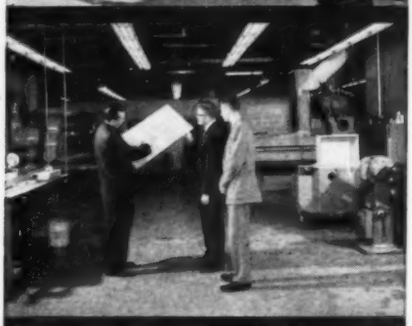
ANOTHER NORTON PRODUCT

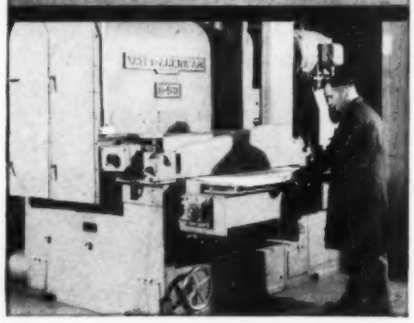
Woodworking theory changes to fact here at YOUR Methods Lab.

An ideal place to:

- determine the advantages of wide-belt sanding and polishing
- solve a particular knotty production problem
- investigate new off-hand polishing techniques
- increase production — lower costs — improve finishes
- process your variety sanding jobs







the men and machines in this building can help you

This is "Abrasive Tech" the Product Engineering Department of Behr-Manning Co.; inside are assembled the most modern production equipment and newest machines for every phase of modern wood sanding . . . wide belt, flutter, spool, drawer, scroll, pneumatic drum — and the new **BEAR Wheel!**

Inside are "Abrasive Tech" specialists — engineering and production experts whose job is to devote their time, skill and energies to helping you solve your problems. And they know their business. There are also Behr-Manning Machinery Methods Rooms in 16 conveniently located branches to help you in exactly the same way.

Write for a detailed brochure of "Abrasive Tech" Product Engineering facilities and a list of the machinery at your service. Dept. WW-9, Behr-Manning Co., Troy, N. Y., a Division of Norton Company.

Branches in: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, New York, Philadelphia, St. Louis, San Francisco, Seattle.

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WOOD FLOUR MAKES DOUGH

. . . when the "secret ingredient" is MELURAC® 304! There's plenty of profit for you in molding light-stable products of wood flour. Melurac 304 melamine-urea resin has no color itself, making pastel products possible as well as dark shades. Colors are stable, too. With proper choice of pigments, they won't fade or discolor even in sunlight. Gives a new color dimension to molded wood products such as chair seats, backs and arms; desk tops; salad bowls; toilet seats; croquet balls. Melurac 304 provides high flexural strength and water resistance plus good screw-holding power to wood flour molded products. Quick cure cycles at low temperatures provide economical manufacture. Wood flour and Melurac 304 offer you a new and real money-making combination!

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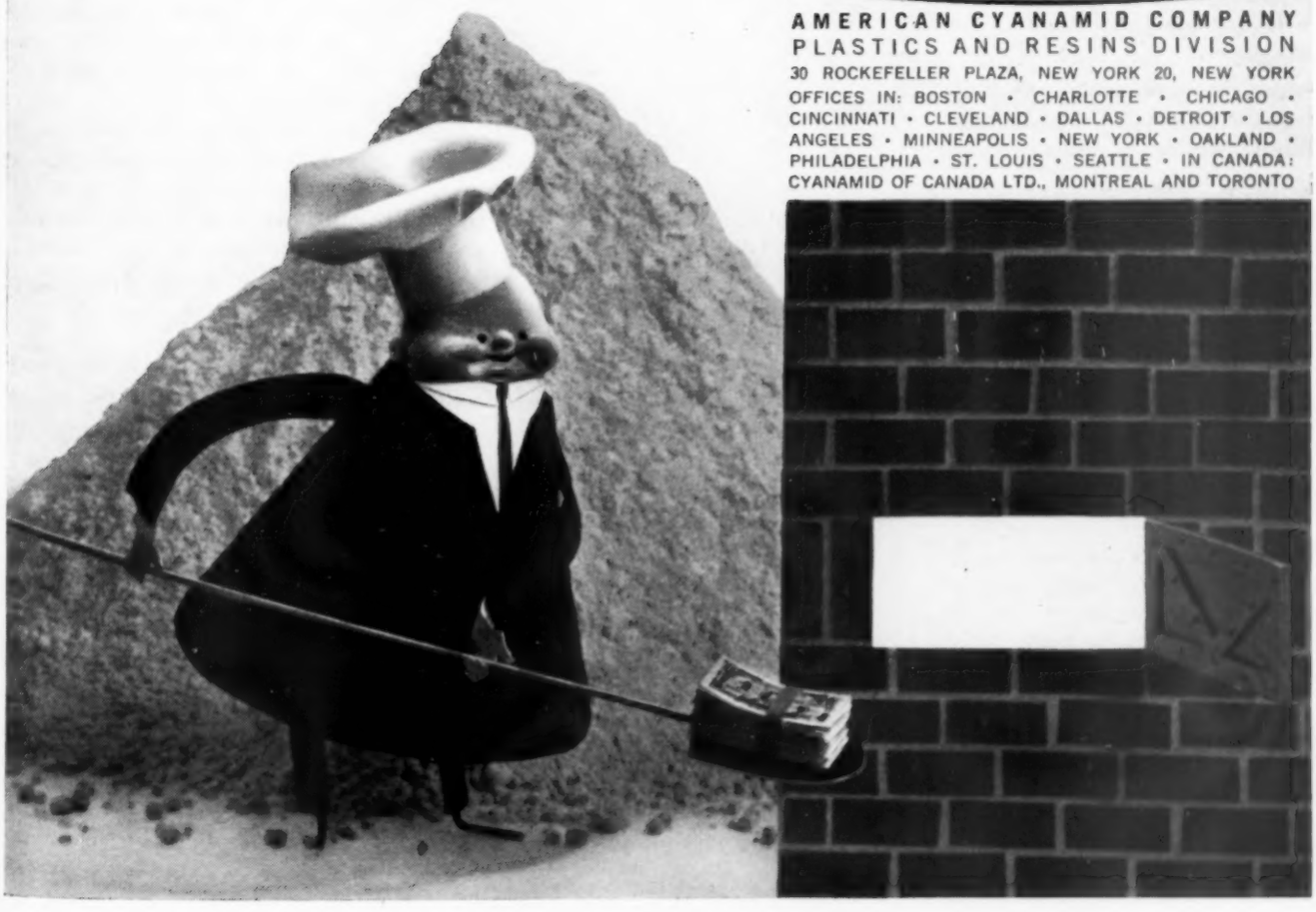

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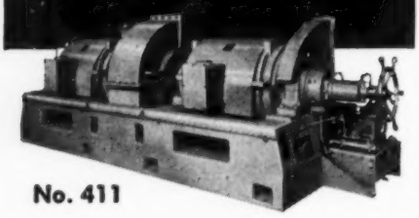
Bauer
DOUBLE
REVOLVING DISC
REFINERS



No. 411

for particles of proper fiber size

In wet or dry process operations, you'll produce better board products by using "Bauers" for refining the raw or steamed wood and defibrated stock. These precision, high capacity refiners provide the particle size you need to meet the most rigid sales specs for appearance, strength, uniformity, etc.

Other Bauer equipment is listed below:

Single Revolving Disc Refiners—for preliminary fiberizing. Wet and dry process.

M.L.S. Disperser-Mixer—for simultaneous blending of additives and fibers in dry and semi-dry operations.

Pump-Through Refiners—for maximum fiber strength development in wet stock preparation.

Continuous Digesters—for steaming chips, or moisture restoration in waste wood.

High Speed Hammer Mills . . . Chip Breakers . . . Specific Gravity Separators . . . Magnetic Separators.

•

For information on any of the above, or for engineering service, contact

THE BAUER BROS. CO.
Springfield, Ohio

Bauer

Letters to the Editor

If you are interested in helping any of these, please write the editor.

Daponite Laminates

"The article on pages 55 to 58 of your June issue concerning Daponite Plastic Laminates was greatly appreciated. We would like to receive further information on its application, and could you also give us the name of the German agent handling this product and its cost."

—L. M., GERMANY

Logs Wanted

"We are in the market for Fir, Hemlock, and White Pine logs to be shipped by railroad to our mill. Please give us the prices on the different species per 1 M. in a size range from 12" to 30" in diameter and 6' to 16' in length. Please price different grades of logs and if possible give probable freight costs."

—S. W., OHIO

Gluing Hardwood Cases

"We manufacture hardwood cases—what is considered the best method of gluing for this type of work? Any information we can receive on how to speed up our gluing operation without cutting quality will be appreciated."

—J. S., OHIO

Veneering Information

"I have been a reader of your publication WOOD WORKING Digest for some time. I would like to say that I consider it an excellent publication.

"We have been in operation for twenty years and are familiar with the processing of solid wood; however, we have very little knowledge of veneering and would appreciate any help available in this field.

"We are considering going into veneering on a limited scale to make lumber core table tops and lumber core plywood in small sizes only.

"Is it possible to buy both crossband and face veneer spliced and cut to size ready to lay or would a re-drying of veneers in our plant be necessary for a successful operation? If re-drying is necessary what type of dryer would be required? In the event we purchased veneers not spliced what machines and steps are necessary to process them to the point where they are ready to glue to the core?"

—W. D., GEORGIA

Needs Hopper-Feed Borer

"Please advise if you know of any manufacturer of 10 or 12 spindle borers with hopper feed for automatic boring of holes for accurate work. This machine has been seen by one of our customers and he has requested that we furnish him with similar piece of machinery.

"The only other information is that this borer working on a horizontal plane is manufactured in the Northeast of U.S. Any information will be greatly appreciated."

—L. W., NEW YORK

How To Plan Work

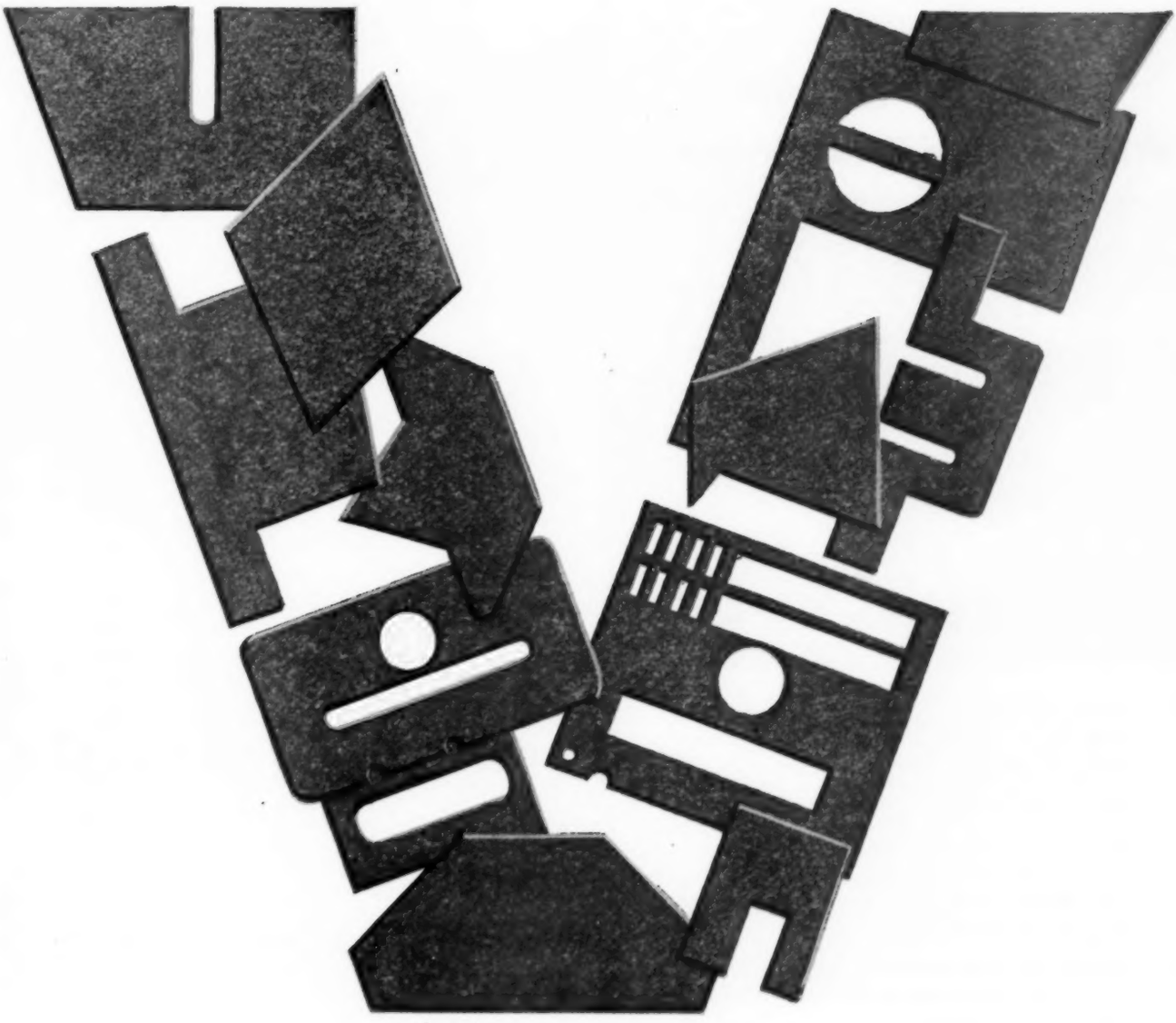
"We are considering re-arranging our woodworking department which manufactures handles for floor sweeping brushes and brush backs and have wondered if you could suggest someone who might be helpful to us. If there is an experienced consultant, we'd appreciate having his address."

—P. H., IOWA

Thanks!

"Thank you for the tearsheets on Wood in the Space Age in your June issue. Its treatment pleased the men in the wood shop."

—G. A., CALIFORNIA



VERSATILE

Bowater Board opens up an entire new range of uses for hard Board. The air process by which Bowater Board is manufactured produces a smooth-on-both-sides Board, tailored more exactly to your requirements, in a wide range of thicknesses and densities, available in a light color. □ These advantages are all available in a competitively-priced hard Board backed by the research, experience and integrity of the international Bowater Organization, one of the world's leading manufacturers of forest products. □ Bowater Board Company's new air-process mill in Catawba, South Carolina, is the ideal source of hard Board east of the Mississippi. Its location, its annual capacity of 160,000,000 square feet, and its rapid shipments—via truck to nearby states—can enable you to meet production schedules and minimize inventory. □ Write or call us for full information.

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BOWATER BOARD COMPANY • CATAWBA, S. C. • PHONE: ROCK HILL, S. C. 328-0131 • A MEMBER OF THE BOWATER ORGANIZATION

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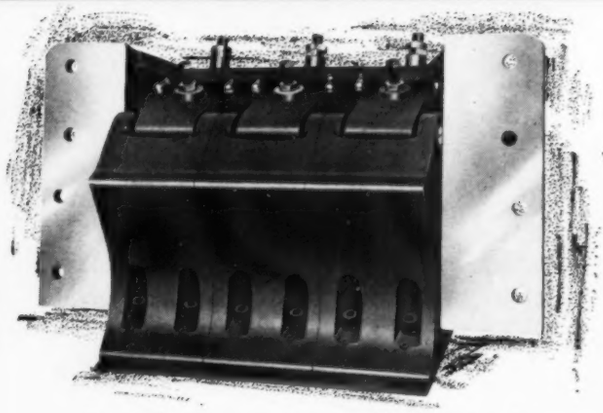
THE M·510
Planer · Matcher

Now Equipped
With The NEWMAN
HEAVY DUTY
CHIPBREAKER



Rugged, all new ductile iron sectional chipbreaker is designed for maximum control of stock.

Production speeds . . . with quality finishes that buyers demand . . . are easily obtained with the improved Newman M-510. It is the machine that has proven itself to lumbermen from coast to coast.

Heavy duty chipbreaker with maximum yield has full floating action and is shock resistant. Machine can be equipped with either six or eight knife cutterheads.

Let us prove to you how the M-510 can improve your production speed . . . quality, too. Call or write today.

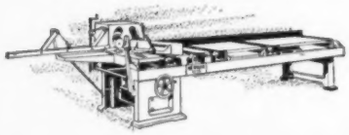
Newman Machine Co., Inc.

Greensboro, North Carolina, U.S.A.

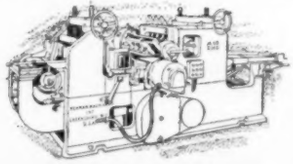
Produce Up To 60,000 F.P.B.
With The Improved . . . **M·510**

WOODWORKING MACHINERY MANUFACTURERS' ASSOCIATION — WMMA

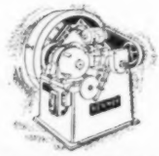
Newman Manufactures 36 Different Machines For The Woodworking Industry A Few Are Shown Here:



M-55 Feed Table



M-68 DMD Planer-Matcher



G-20 Automatic Knife Grinder

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The Editor's Page

Meet Clarence Pearson

For over 60 years WOOD WORKING DIGEST has been partners with the woodworking industry. The magazine has mirrored the advances of the industry and takes pride in the thought that, in some small measure, it has contributed to the growth.

Our function as publisher is to match the importance of the woodworking industry with a quality magazine devoid of such commercialization as would enrich the publisher first and serve the industry last. The woodworking industry, as an industry, as a profession, as people, must always come first. Any publication, to deserve the industry's respect and be accepted as the voice of its people, must concern itself with service first. WOOD WORKING DIGEST will endeavor to merit the confidence the industry has shown over the past 60 years.

Our former editor, Miss E. McDaniel, was a proud editor on our staff. Her devotion of woodworking and its future commanded respect from fellow workers and from industry leaders. She left to enter another field of editorial endeavor which was more in harmony with her personal interests. Her departure was a personal loss as well as a loss to the industry. She will be missed.

However, the traditional high ethical standards of WOOD WORKING DIGEST will be maintained and its activities will continue to be harnessed to the forward movement of the industry. The new editor, Clarence Pearson, is well qualified to carry on the fine work which has made WOOD WORKING DIGEST for over 60 years the leading voice of the woodworking industry.

Pearson, 42, is a Rockford, Illinois, man with a wealth of experience. He spent the past six years in the heart of the woodworking industry, the Woodworking Machinery Division, Greenlee Mortising and Boring Tools, and Buss Machine Works, plus many other phases of Greenlee Bros. & Co. activities. He is an experienced writer and editor, and is familiar with the vexing problems of the woodworking industry.

Before Greenlee, Pearson was with Barber-Colman, Amerock and Borg-Warner at Rockford.

His hobbies also emphasize the well-rounded personality you will learn to know as "Mr. Woodworking." They include work in numerous media of art and photography, golf, fishing, basketball (he could make a long, slim one-arm reach for the basket on his toes), football, and Americana with emphasis on the Civil War period.

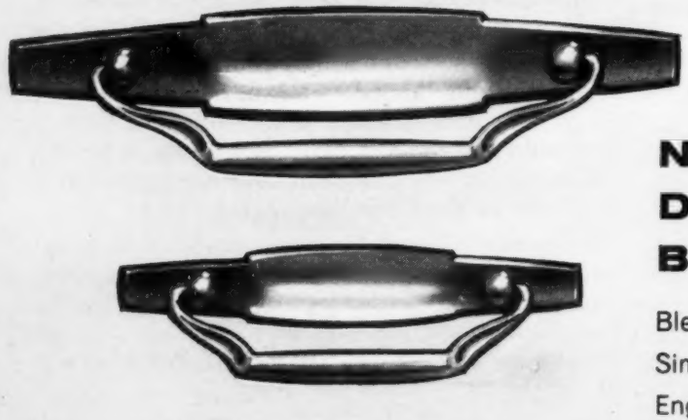
Pearson's military duty was with the U.S. Army Signal Corps during World War II. His wife, Doris Mae, is a former orchestra director for the Rockford Public Schools and is a concert violinist. The Pearsons have one daughter, Lucia Mae, age 11.

We are proud to introduce your new editor. His experience and personal background will enable him to richly contribute to the future of the woodworking industry and to a realization of the bright promise the future holds for the woodworking industry.

Wm. F. Schleicher

Vice President and Editorial Director

TRIM AND
TASTEFUL



NEW TRANSITIONAL DRAWER PULLS BY NATIONAL LOCK

Blend period and contemporary designs. Simple, striking lines and rich Antique English finish lend grace and taste to fine furniture for home and office. Wrought steel backplate, die cast zinc bail. On 3" and 4½" centers. As always, National Lock high quality means lasting satisfaction.

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Industry Notes

N.C. State College Kiln Drying Course

The five and a half day course will be conducted by the College's School of Forestry, the U. S. Forest Products Laboratory, and the Southeastern Forest Experiment Station in cooperation with the college's Extension personnel and the Southern Furniture Manufacturers' Association.

North Carolina State College will present its seventh annual kiln drying course, September 12-17 on the college campus.

Featured in this year's program will be control of moisture content, drying without degrade, fast drying systems, and forced air drying. During the course, students will actually operate the State College Pilot-type dry kiln. Classes will be conducted in the North Carolina State College new Wood Products Laboratory.

Included on the teaching staff will be Roy M. Carter and Al J. Stamm, both professors of wood technology, N. C. State College; Walton R. Smith, Rufus H. Page, and Louis I. Gabby, Southeastern Forest Experiment Station; Ray C. Riete, kiln engineer, Forest Products Laboratory, Madison, Wisc.; and representatives from Redman Engineering Service, High Point; Moore Dry Kiln Co., Jacksonville, Fla.; and Delmhorst Instrument Co., Boonton, N.J.

Additional information may be obtained from L. H. Hobbs, Forest Products Extension, School of Forestry, North Carolina State College, Raleigh, N.C.

Fall Market Dates Set In Grand Rapids

Barry Stuart, sales manager of Johnson Furniture Co., and president of the Grand Rapids Furniture Market Association, announced the October Market dates, set today by the association's executive committee.

"The October Preview Market, first in several seasons here, will be held October 17-21," Stuart announced.

The establishment of market dates follows the Association's announcement last month during the Summer Furniture Market in Grand Rapids that a fall preview showing will be held.

No Mahogany Shortage

In response to many inquires received from the trade, George T. Kinley, president of the Mahogany Association, states that the present political unrest in the Congo and Cuba will have no effect upon the supplies of Mahogany since practically all Mahogany imported into this country comes either from Ghana and French Equatorial Africa or from Central America.

Kinley states further that present inventories of Mahogany veneer and lumber in the United States are sufficient to fulfill the requirements of the industry and the constant flow of logs and lumber from Africa and Central America insures that no shortage will develop in the near future.

Discuss Wood Products Safety Practices

Dozens of safety subjects—ranging from how noise is controlled to how automation in saw mills improves workers' safety—will be discussed at wood products sessions of the 48th National Safety Congress, annual convention of the National Safety Council to be held here October 17-21.

The following will be of special interest to delegates to wood products sessions of the Congress: Failure of safety men to do their job, a belief based on injury reports he has studied will be pointed out by Dr. J. R. Naden, chief medical officer, British Columbia Workmen's Compensation Board, Vancouver, keynoter at the October 17 session. Safety in an automated sawmill will be discussed by Howard A. Curtis, general safety supervisor, Simpson Logging Co., Shelton, Washington.

One wood products session, on conservation of hearing, will feature a film on ear protection, as well as an illustrated talk on controlling noise from wood planers.

The National Safety Council's pulp and paper section will hold a joint session and a joint luncheon October 20 with the Council's wood products section. Several pulp and paper awards will be presented at the luncheon.

The joint session will cover tractor safety, standardization of signals for logging truck drivers, and coordination of logging safety programs with independent contractors. Talks will be given by Ed Kruse, engineer, Oliver Corp., Chicago; E. Paul Le Roy, safety engineer, Weyerhaeuser Co., Chehalis, Wash., and Merril D. Ely, chief safety branch, U. S. Corps of Engineers, Portland, Ore.

Central States Pulpwood Production and Consumption Increases

According to Joseph J. Mendel, Central States Forest Experimental Station, Columbus, Ohio pulpwood production continued to increase in the Central States during 1959. A new record of 357,761 standard cords was established. This harvest represented an increase of almost 23 per cent over the previous high of 1958 and had a gross value delivered at the mill of $4,853,000. Consumption of pulpwood by Central States mills paralleled the gains in production reaching a new high of 359,088 cords used, an increase of 22 per cent over 1958.

OSC Forestry School Draws Commendation

The Oregon State College school of forestry—oldest in the West and one of only 28 accredited schools

in the nation—has received special commendation from a Society of American Foresters inspection team, and approved by unanimous vote of the Council of the Society.

The OSC school was termed "one of the truly strong forestry schools of the U.S." and a "model" for others to follow in the report of the national accreditation team. Accreditation inspections, first started in 1932, now are made each ten years.

In announcing the report of the national inspection team, President A. L. Strand pointed out that the OSC forestry school is unique in having its own 1,000-acre forest just seven miles from the campus. School of forestry officials pointed out that OSC is advantageously situated in the center of one of the nation's leading forest regions. Within easy driving distance of the campus are forest types ranging from the rain forest of the Coast to the semi-desert pine forest, plus forest industries of every kind.

The demand for OSC forestry graduates far exceeds the supply each year. Forestry students are drawn from throughout the United States, and foreign lands.

Graduate school work in forestry has been increasing rapidly in recent years. Some 30 students will be working for master's or doctor's degrees this coming year. In June, OSC graduated 80 forestry students from the four-year program and gave seven master's degrees.

W. F. McCulloch has been dean of forestry since 1954. Department heads are J. R. Dilworth, forest management; William A. Davies, forest engineering; and William I. West, forest products.

Hold Planning Session on SPA's 1961 Machinery Exposition

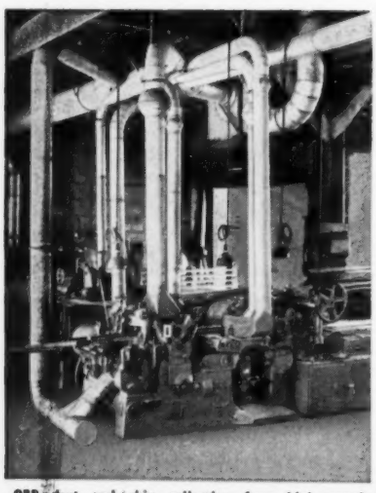
A special Exhibitor Advisory Committee met in New Orleans, July 22 to consider plans for the Southern Pine Association's 1961 Machinery Exposition. Presiding was D. L. Fair, Jr., Vice-Chairman, SPA Mechanical Efficiency and Safety Committee. The Exposition will be held April 7-9, 1961 at New Orleans' Municipal Auditorium. It is to be the sixth such event that SPA has sponsored.

The planning session was held in an effort to assure even greater attendance than at the 1959 Exposition, when more than 1200 lumbermen and others were on hand, and maximum participation by machinery manufacturers.

The Committee reported that "unprecedented interest" had followed the first announcement of the 1961 Show, issued in April. Initial response indicates that many additional exhibitors will take part, the report said, and plans are underway to substantially augment the exhibit space.

INCREASE PRODUCTION!

Bring your Dust & Waste handling up to date with a Modern OBP System



OBP dust and chip collection from high speed moulder incorporates ball joints for quick, easy access to machine for set-up and maintenance. Proper engineering of system eliminates any possibility of chip fall back onto work, and guarantees years of trouble-free operation.

For a surprisingly low cost, Ohio Blow Pipe can revise your present system to current requirements or anticipated capacity. At the same time, the newest and most efficient engineering advances can be incorporated. And OBP can revise your system without necessitating a shutdown of your plant.

A modernized OBP system can greatly increase per man hour production, reduce fire hazards and handling costs, increase machine life, up-grade work quality and result in better working conditions and relations within your own plant as well as in the surrounding community.

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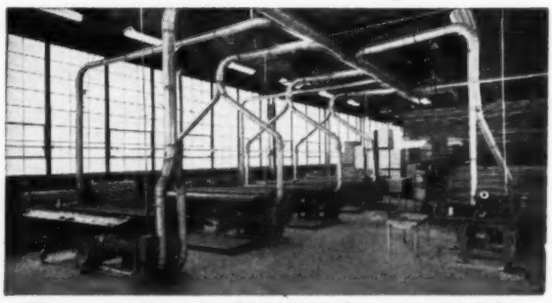

OBP system installed on line of multiple saws keeps area neat and clean — promotes much better working relations, and actually is responsible for increased production.

Photo shows OBP collector located on storage silo. This is part of an extensive system which automatically conveys all dust, wood flour and chip waste to furnace for use as free fuel.

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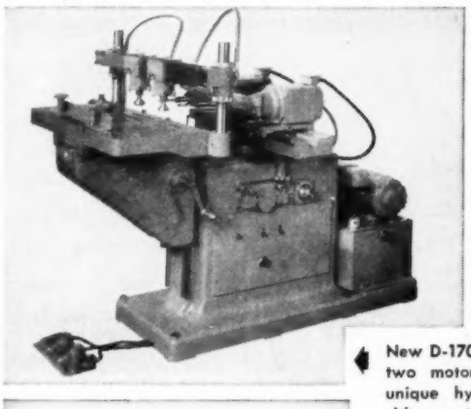
ROOT HORIZONTAL BORERS

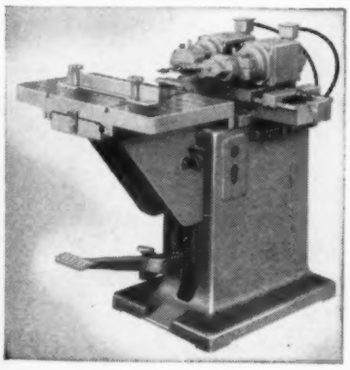
FEATURE ENGINEERED TO MEET A WIDE RANGE OF REQUIREMENTS

Style D-200, an exceptionally versatile horizontal borer, has highly flexible hydraulic feeds, up to 6 motorized spindles--bores holes in edge, ends or face of stock—noted for its many features.



New D-170 Radial Borer, has two motorized spindles, — unique hydraulic feed for either automatic continuous or intermittent operation—is adaptable to multiple boring heads—many other features.

Style DM has ball bearing slide ways, adjustable table, direct drive electric spindle, 2 speed motor, hand or foot treadle feed — can be fitted with multiple boring heads.



Style D-150, 2 spindle, foot and hand feed borer, has motorized spindles with radial heads, ball bearing feed works, plus the latest adjustments and accessories.

The Root line of horizontal borers includes machines that provide combinations of features to meet, with the greatest economy and efficiency, just about every type of screw hole, dowel hole and similar boring operations. From foot and hand feed to the newest hydraulic feeds for completely automatic or semi-automatic operations—from single spindle to multiple spindle design with all spindles directly motor driven—for in-line or staggered hole patterns —for adaptability to cluster boring heads—for versatility, ease of operation, maximum productive capacity—whatever your requirements there's a Root Horizontal Borer that's feature engineered exactly to your needs.

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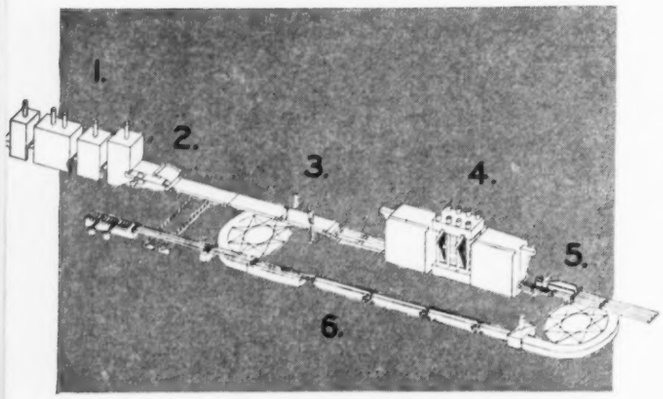
BOWATER BOARD COMPANY

—new 160 million square feet per year, dry process hardboard plant relies on Washington press and forming equipment.



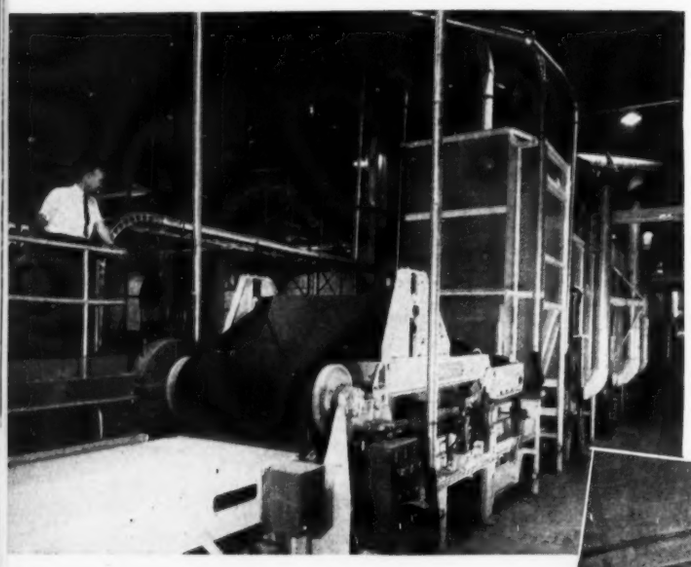
Forming line in the Bowater plant is designed for daily production of 500,000 square feet of hardboard. Washington equipment includes (1) felter, (2) precompressor, (3) cutoff and trim saws, (4) press, (5) board separator and (6) caul conveyor system.

LOCATION: Catawba, South Carolina
PLANT ENGINEERS: Bowater
PRODUCT: Smooth-both-sides "Bowater board"

The 5,274-ton, 20-opening, 56″ x 202″, simultaneous-closing Washington hot press is one of the keys to high production and efficient operation of the new Bowater plant—the largest dry-process hardboard mill in the U. S.

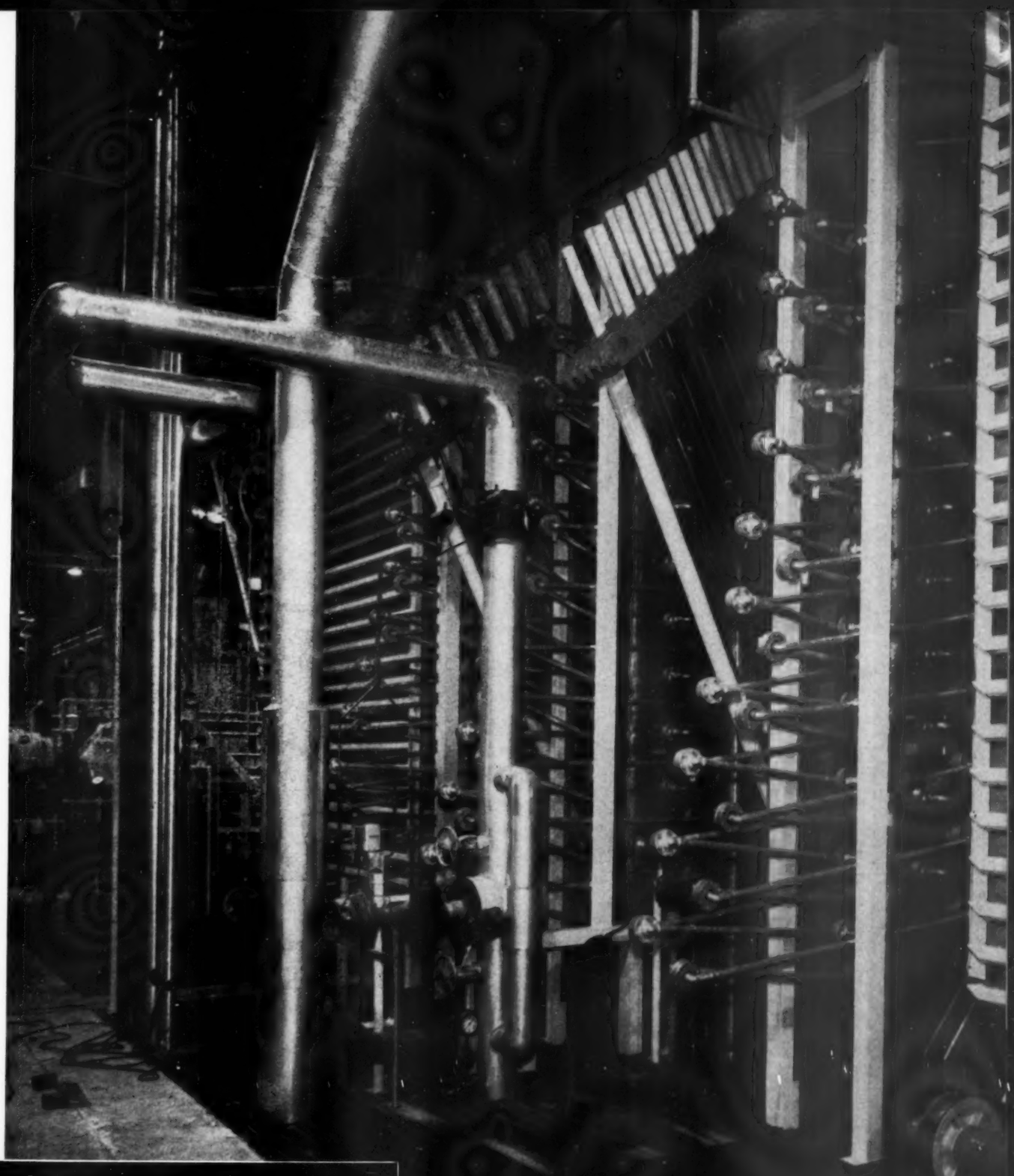
The entire forming line equipment supplied by Washington Iron Works includes felter, precompressor, mat cutoff and trim saws, board separator and circulating caul conveyor system, all custom-engineered for the Bowater installation. This equipment was designed jointly by Bowater and Washington engineers, working together from the time the new mill was in the initial planning stages.

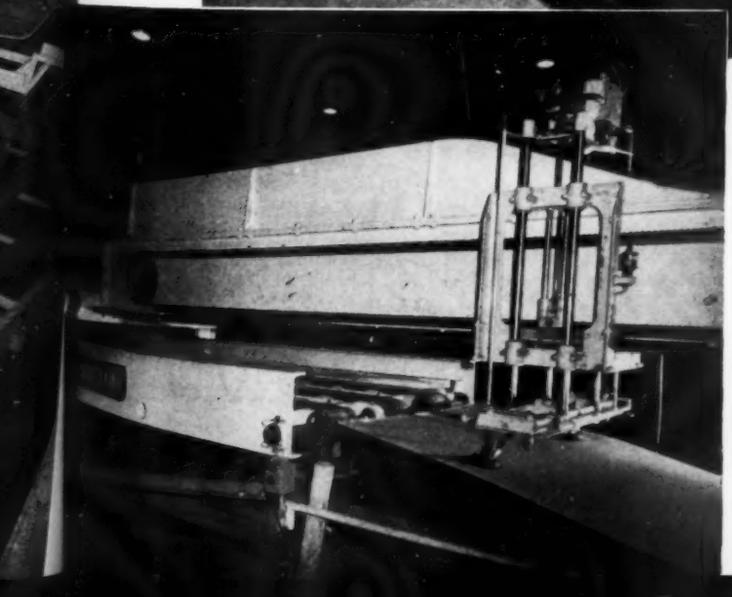
Washington press equipment is the choice of many other outstanding producers of hardboard, flakeboard, particle board and plywood. Combined capacity of board plants using Washington equipment is now over 30 acres per day, half a billion square feet per year. If you are considering a new board plant, we cordially invite your earliest possible inquiry. Washington Iron Works, 1500 Sixth Ave. South, Seattle 4, Washington.



Five oscillating nozzles delivering selected fibers permit controlled thickness, composition and density in the felting process. Shaving and precompressing follow, in the Washington unit shown above, after which the mat is cut off, trimmed and conveyed to the synchronized caul conveying system.

A unique feature of the Bowater forming line is the Washington-built caul turntable shown at right. A combination of chain and belt conveyors makes the caul system fully automatic and continuous. Washington cutoff and trim saws can be seen at the upper left. Photo on opposite page shows how boards are separated from the caul sheets after hot pressing by the Washington-built separator, using vacuum cups on a reciprocating carriage which operates while the cauls are moving.





Heart of the Bowater forming line is the 20-opening, 56" x 202" Washington hot press, above. The patented simultaneous-closing mechanism permits closing speed of 530" per minute. The press operates on a 2-1/2 minute cycle, producing 4' x 16' hardboard panels from 3/32" to 3/8" in thickness.

WASHINGTON PRESSES

WASHINGTON IRON WORKS

and ACCESSORY EQUIPMENT

HOT PLATE PRESSES • PULP BALING PRESSES
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COMPLETE BOARD FORMING LINE EQUIPMENT

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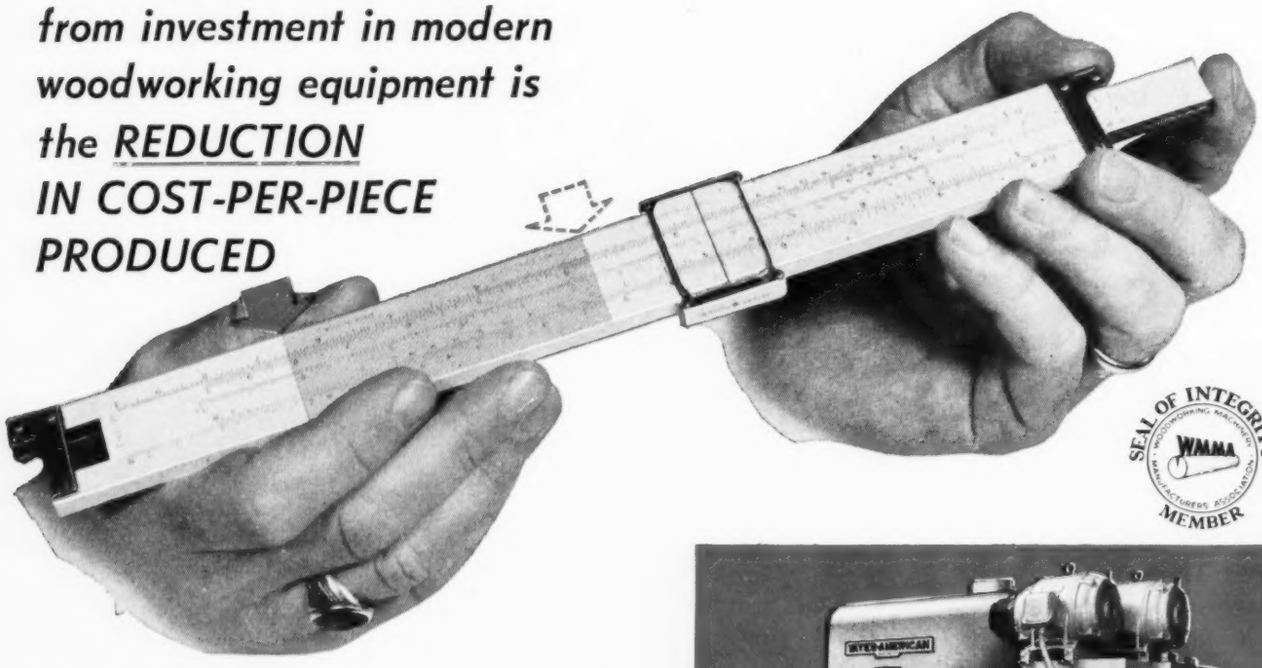
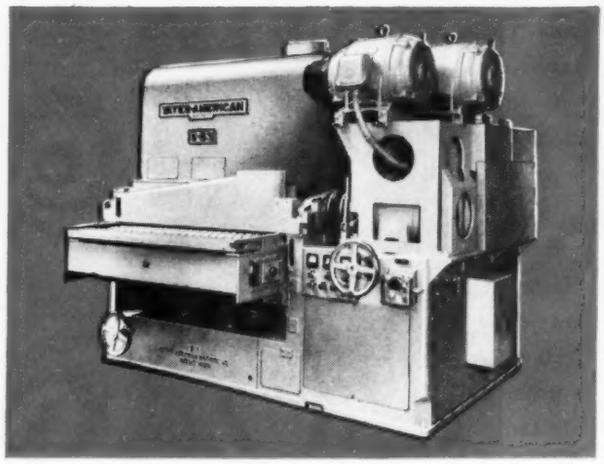
true measure of savings from investment in modern woodworking equipment is the REDUCTION IN COST-PER-PIECE PRODUCED



SEAL OF INTEGRITY WMMA MEMBER

Profits are established on the basis of the cost-per-piece produced. Investment in modern equipment that results in increased production volume or lowered production cost automatically reduces the cost-per-piece . . . and increases the profit. This increase measures the *Savings* resulting from the investment.

For example, the Model S-53 combination Drum and Belt Sander finish sands at speeds up to 90 feet per minute—*three times faster than the conventional drum sander* . . . and the improved finish obtained eliminates over 90% of the stroke sanding operations that ordinarily follow. At the same time the selective contact shoes for the sanding belts on the S-53 provides the proper pressures to produce the finest finishes — resulting in substantial improvement in the product.



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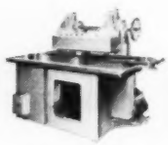
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Cuts precision miters—right or left

New Delta 12"-14" Long Arm Radial Saw, also 16"-20", 10" Portable and 9" models.

You'll really appreciate the new Delta 12"—14" Long Arm Radial Saw when you make miter cuts on wide, irregularly shaped millwork (like the fireplace mantle header shown above.) With exclusive Delta "turret arm" construction the blade rotates a full 360° above the table—you cut accurate miters from either right or left side, work on the top surface *at all times.*

In addition to extra ripping and cross-cutting capacity, this new Radial gives you the power you need to get your jobs done faster, easier, and accuracy you can depend on for the life of the machine. And like all the popular Delta Radial Saws, this new model is a real buy because it has the most wanted quality features that only 31 years of experience can build into a machine.

See for yourself—your Delta Industrial Distributor (listed under "TOOLS" or "MACHINERY" in the Yellow Pages) will gladly show you the rugged, versatile Delta Radials and complete line of Delta woodworking tools and accessories he carries. Write for FREE Radial Saw bulletin: Rockwell Manufacturing Company, Delta Power Tool Division, 666J N. Lexington Ave., Pittsburgh 8, Pa. In Canada: Rockwell Manufacturing Company of Canada, Ltd., Guelph, Ontario.

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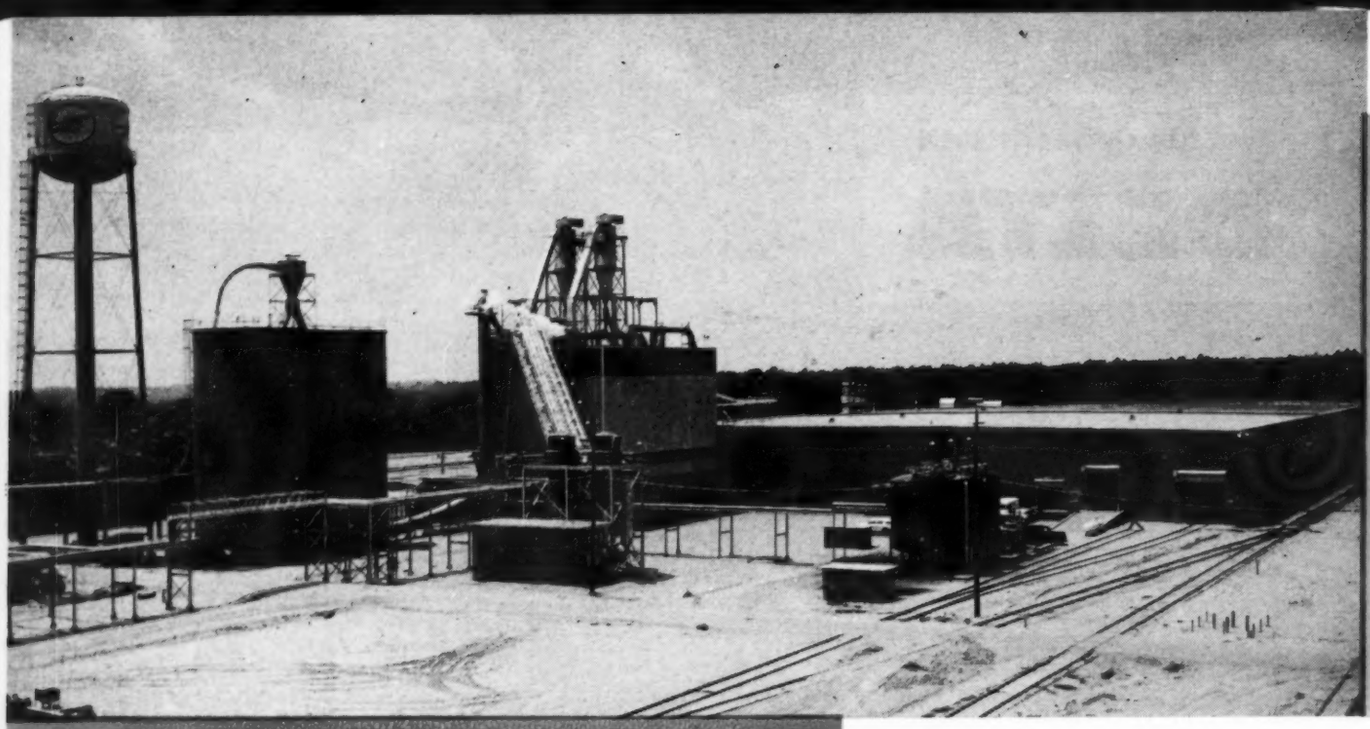


"New Dry Process Hardboard Can Be Tailored to Your Needs"

says–

John G. Robinson
Bowater Board, Plant Manager

Here is the fascinating story about the new Bowater Board plant at Catawba, South Carolina. It explores the thinking of the man responsible for the original plant planning and its present operation. You can learn about the new dry process hardboard–how and why it applies to numerous unusual uses.

Exclusive Interview

by Darrell Ward
Engineering Editor

"On the machine felter we are not limited by the thickness of the sheet that we can form. The mat can be made any thickness we want up to the limits of the press openings. This permits complete control of density and thickness."

"The machines used in the dry process permit wider variations in the board. The formulation, the wood species, type of fiber, chemicals added, all are variables which can be precisely controlled," explains John Robinson to visitors looking over the new plant.

Dry process hardboard has numerous applications which can save you money and help you produce a better quality product. It is not merely a substitute material to be hidden away in case backs, drawer bottoms or dust panels.

The dry process board is quite different from wet process boards. It offers extreme flexibility in its manufacture to suit your needs, not necessarily the wishes of the board manufacturer. It is formed with greater internal bond strength to enable you to make a better quality end product. Being smooth on both sides, it lends itself perfectly to surface laminates and to direct finishing of all kinds. Therefore, it makes a better looking product at a lower cost.

Because of the flexibility in forming the Bowater board, you can specify high density, smooth surface to the point of being shiny, abrasion resistance, and very close tolerances when necessary.

An outstanding feature we learned from Mr. Robinson is that a very thin high-density board with no directional grain problems is made available for cross banding to eliminate all telegraphing.

You will not have to stretch your imagination too far to think of many applications for a smooth-two-sides board which can be supplied in any required thickness from 1/20" up to ½" or more, in any desired density and with an internal bond three times as great as ordinary wet process boards. These are a few of the eye-opening features explained to us by Plant Manager John G. Robinson in the following exclusive tape-recorded interview.

What Does Flexibility Mean?

The dry process provides greater flexibility in tailoring a board to the specific end use. The very equipment and method used in the air process permits a wider range of controlled variations in the board. The formulation at the very beginning, the wood species, type of fiber produced by the refiners, chemicals added, all are variables which can be closely controlled to contribute widely different properties according to a customer's needs.

In the dry process, more variables can be controlled better than in the wet process because you can add chemicals to the dry process without fear of losing water solubles down the drain. This opens up two new areas in the field of chemical additives. Better formulations with water solubles can be made because the chemicals will not be washed away. And, entirely new formulations can be made with non-water solubles which could not be used in a wet process board but which can easily blend in a dry mix.

How Does This Modify The Board?

Chemicals can be added to the fiber to improve the strength of the board, to improve the impact resistance, to improve or lower the water absorption, to improve the surface by making it harder, smoother, more abrasion resistant, and even more shiny, if desired. Internal bond, one of the most fundamental yet vital features of any board, also can be greatly improved with additives which blend better in the dry process. All of these things add up to make a better board, and frequently a quite different board, for particular end uses.

On the machine felter, we are not limited by the thickness of the sheet to be formed. There is no limit other than what is practical on how much opening you can set in the press to produce a given thickness of board.

There are definite limitations in mat thickness formed on the standard Fordrinier machine before you run into drainage problems. In the Bowater system, we have more flexibility all along the line and can do more things not mechanically or chemically possible otherwise. Some we haven't even tried yet, but we are aware of many rather unbelievable possibilities yet to be developed for improved qualities in a board.

Compare Different Board Specifications

One of the most evident specifications we will meet is high internal bond to make a satisfactory board for plastic laminating. Board made by other processes have not been able to meet the requirements for this application.

"We can raise internal bond strength to over 600 psi in the dry process, more than twice as high as wet process boards."

Internal bond can be raised to 600 psi or even higher in the dry process but it is impossible to form a board of that strength in any wet process. None of the standard wet process boards run as high as 300 psi. Tempered boards will have slightly higher internal bond strength. Comparing boards at the same specific gravity, dry process boards will have bond strength twice that of wet process boards.

High internal bond is a necessity to prevent the final laminated product from delaminating. Delamination is caused by strain introduced in the board during pressing in the laminating operation and in use.

Plastic laminators using high-pressure laminates usually press at about 1000 psi or more. If the customer uses a low internal bond board for laminating at pressures of 1000 psi, the board will delaminate and actually split apart right through the middle. Top and bottom faces will merely slide like the slices of bread in a sandwich.

Wood veneering, of course, does not require these high pressures so it is possible to apply wood veneers to practically any hardboard.

How Significant Is The S2S Board?

In practically every end use, the smooth-two-sides board is more desirable than the screened back board. The screen on one side of a board is only there from necessity, to let steam escape from the wet process board when it is formed in the press. That is its only function. It is a necessary evil in the process.

The S2S board is essential to good appearance

When Kroehler announced Cultured Wood to the public, we did more than give you a mere press kit release of the news. We went behind the scenes and probed into the thinking which spearheaded action in the new concept.

This time we have gone even further. Instead of talking about what the new Bowater operation looks like, we arranged a special tape-recorded interview with Plant Manager John G. Robinson to give you his personal interpretation of what the new board is, what it will do for you, and how you can obtain his help to work out problems in your own plant.

The challenge of building an entirely new kind of mill with significant modifications for the new process, drawing on past experience with Rhinelander and Weyerhaeuser, using plenty of imagination—all this was impossible for John to turn down when Bowater extended their invitation. He spent a year and one-half in the Coos Bay, Oregon, pilot plant, modifying dry process techniques to arrive at the recent accomplishment.

This is the kind of man we interviewed to bring you the practical inside information in typical Hitchcock fashion.

"Whatever it may be, we are ready to tackle the problem of tailoring exactly what the customer wants, what he can use, and what he can afford to buy."

in anything like kitchen cabinet doors because the panel will be seen from both sides. It also adds to the appearance of case goods because the back side of a panel can be seen when a case is moved away from a wall and when drawers are occasionally removed. The board which is smooth on both sides certainly adds to the quality appearance even if it is not on display all the time.

Mechanically, the S2S board has other desirable properties. It is evenly balanced, a great improvement over the screen back board. The screen face is softer and will absorb more moisture, therefore the screen back board will tend to warp more easily.

What Does A Gloss Surface Mean?

The potentially glossy surface is only indicative of smoothness and hardness. Glossiness of itself probably has little significance in a board. However, up to a point it can be an advantage for pigmented and printed finishes. Beyond that, glossiness would be incidental to the other properties.

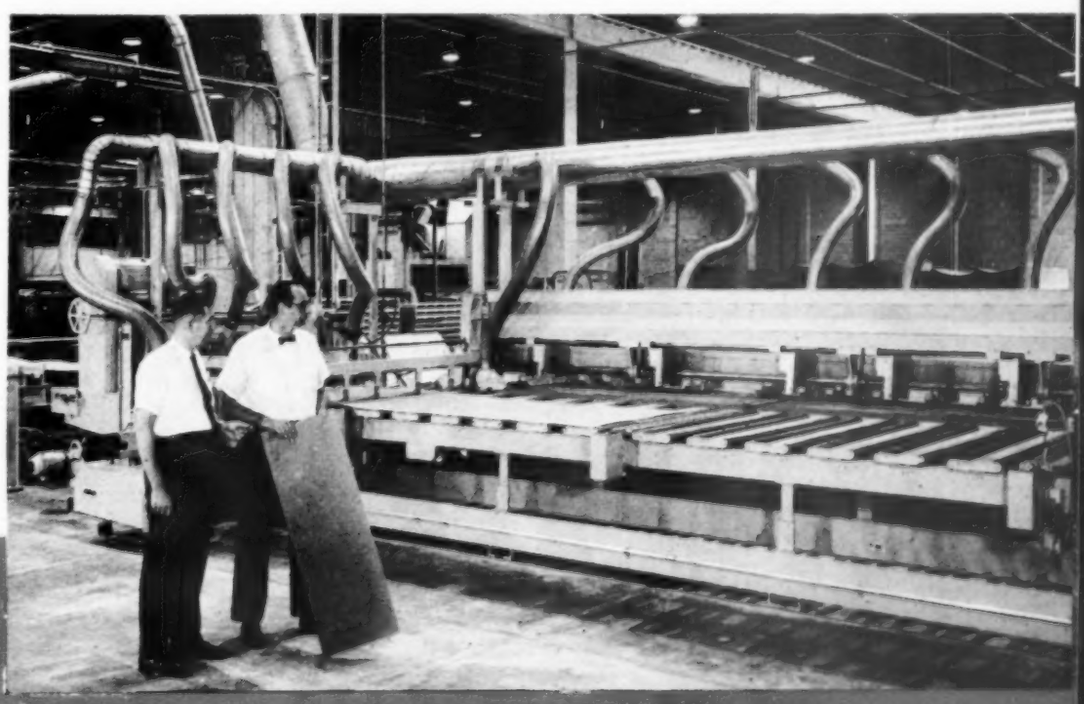
On the other hand, considering that glossiness is associated with hardness, we get into the area of abrasion resistance. Of course hardness and abrasion resistance are important when surface wear is present. Then the hard, glossy material is more satisfactory.

How Far Can Abrasion Resistance Go?

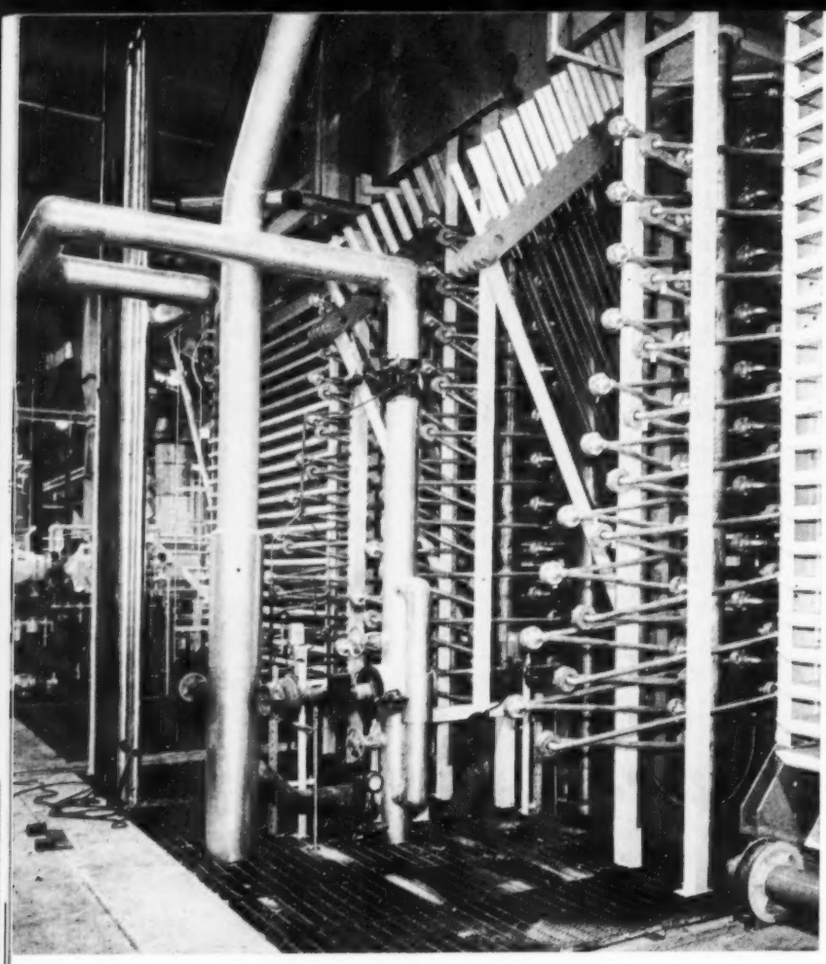
This illustrates the flexibility of the dry process. Abrasion resistance beyond the normal potential of the original board can be increased to an unlimited extent by additives blended with the fiber. Some undoubtedly would be expensive chemicals, but they need not penetrate throughout the body of material. We can limit them to the surface of a board when high abrasion resistance is necessary and yet still eliminate the prohibitive cost of filling the entire board with expensive chemicals. This we do by adding the chemicals only to the fiber which forms the surface layers.

We can add practically any type of resinous material, phenolic or anything else, if the specifications and price will warrant this modification.

We can make a marine type board, completely impervious to moisture and corrosive elements, but like the particle board people, we will ask the same question, "Who will pay for it?" Yet, like so many other products, the need eventually will occur and when the customer will pay the price the market will stand it.



Plant Manager John G. Robinson and Sales Manager J. R. Hahn watch the Mereen-Johnson panel saw cut finished hardboard to a customer's dimension specifications.



This 5274-ton, 20-opening, 60" x 200" Washington press features simultaneous platen closing at the rate of 530 inches per minute, holds tolerance of 0.020" as it works at 525°F under steam pressure of 850 psi.

Explain Bonding Problems If Any

I think there is no problem in bonding our hardboard because it is traditionally bonded to wood. People who bond hardboard in their regular manufacturing have found adhesives which are quite satisfactory.

One difference, however, in our high-density board is that it absorbs less adhesive than wet process hardboards. This provides an economy feature which, of course, is to our advantage in selling the board.

Compare Hardboard Cross Band With Wood Veneer

When you cross band, you rotate the grain of your veneer at right angles with the adjoining layers to utilize the longitudinal grain or fiber stability. But, our hardboard cross band has the same properties in all directions. This is a great advantage because you don't have to orient the board.

The economy of these features is rather evident. The gap-bridging quality enables the user to develop far better quality panels with a much lower grade of core stock. Thousands of dollars a month can be saved on the cost of core stock alone in a good sized operation merely by taking advantage of the high-density hardboard cross band.

Further economies can be realized from the fact that an entire sheet is usable and no waste will occur from cross band defects or from orientation problems. It makes no difference which way you lay it because there is no grain direction.

Why Is There No Grain Direction?

The nature of our air process eliminates layering and grain orientation because we are floating the processed wood fiber—not chips, particles or flakes—by high-pressure, high-velocity air conveyors. When these fibers are driven against the felting screen and the air is exhausted through the wire, a mat is formed with fibers oriented in every direction: lateral, longitudinal, vertical and every angle in between. There are no stiff splinters or chips to bridge gaps and leave pockets.

When this fully integrated mass of locked fibers is compressed into a board, it results in a product with equal properties in all flat plane directions and therefore has no grain direction.

Does Hardboard Compete With Particle Board?

Hardboard and particle board do compete for some end uses, but this is more a matter of overlapping. They compete, for instance, as core material only in thin cores. Decorative laminates are traditionally applied on hardboard. But a core for wood veneers is actually a replacement in most cases of lumber. Thickness required is beyond normal thicknesses of hardboard.

We have produced board up to ½-inch thick and can produce it up to ¾-inch. We have produced boards experimentally which gave us all the properties of particle board core material except for screw holding power. Because of our fine fiber surface layer, we can completely eliminate the age-old problem of telegraphing.

Our thin cross banding board will excel anything yet produced. This smooth surface material will not telegraph through to any material from any kind of core. It is high density board which we have produced in a thickness of 1/10-inch and can go down to 1/20-inch except the thinner material is not practical to handle in our standard 4-ft. x 16-ft. sheets. But, it is very practical in small size sheets.

This dense, ultra-thin board will bridge gaps more than two or three times its thickness and still not telegraph. That, of course, is a property which no other veneer or cross banding material can do.

What Is Your Production Rate?

This plant is designed to operate at speeds about twice as fast as any existing dry process plants. We can produce at 130 fpm in the 4-ft. wide board. That puts us in a competitive position with other materials, even down to the thin cross band board which would run at the same speed, of course. Because of mechanical reasons, thickness is not a factor in production speed. We will run a ¾-inch sheet at the same rate we run the 1/20-inch.

What Tolerances Do You Hold?

We hold tolerances of about 0.020-inch in the new type Washington press; we can reduce this to 0.005-inch with a special version of the Yates-American S-53 sander. This machine is usually built to accommodate combinations of drums and wide belts for progressive sanding in one operation. In our case, however, we use three belts which can run at higher speeds than drums in order to handle the output. That way we are able to run 90 fpm, or about three times the speed of an ordinary drum sander.

But when you ask about tolerances, I believe we have to make the tolerance what the customer requires. The figures I am citing are for our present normal production. If a customer is working with closer tolerances we can comply with his needs by supplementary sanding.

How Will Your Customer Establish Specifications?

The flexibility and modifications permissible in our system enable us to supply a custom board at competitive prices. We are not in the market merely to produce a competitive board with typical specifications, although the plant was designed primarily to handle existing market needs.

Since we can work with an infinite number of variables to tailor a board for specific uses, we will want to know a number of things about what the customer needs for what he is doing.

The most important thing to know is how the customer is using the product he now uses, specifications from tests representative of the properties required for his particular applications. This is a difficult problem in the woodworking field. There are numerous tests run and many specifications written, but a number of them are not realistic.

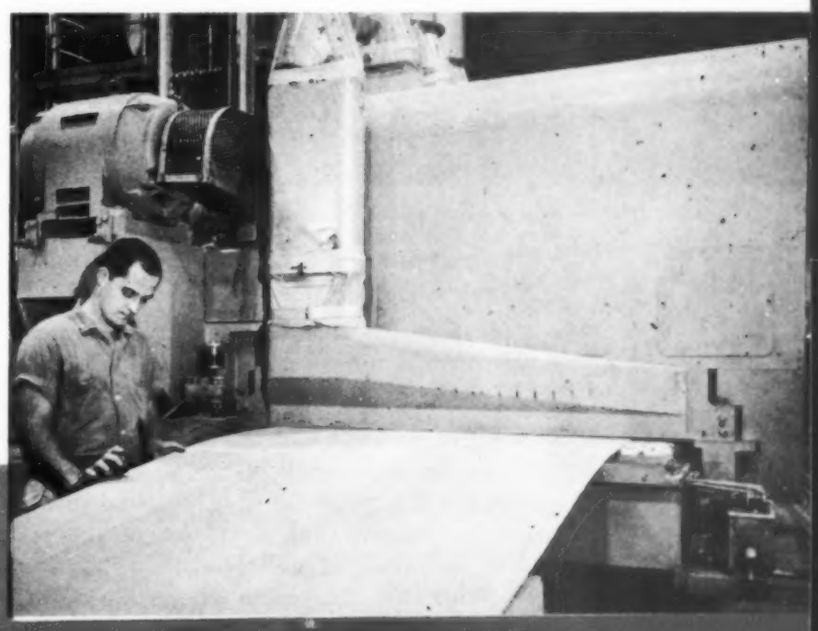
So often we find that traditional laboratory tests have been run on a material and an elaborate set of specifications written up. But, you can supply a product which will more than meet all these specifications and it still will not perform satisfactorily because it is different in some respects that have not been taken into consideration.

In many cases, a man may not even know exactly what properties he is utilizing in a particular material. He just knows it works the way he wants it to work without regard to whatever the specifications might list. Some of the specifications which are so tediously defined may have no significant meaning for the application. And, some specifications which would be pertinent, perhaps very important to the customer, are not even included.

That is why we need to develop good specifications for a material according to the way it is being used. Once we know how the product is being used and what is demanded of it in performance, we can work toward realistic specifications and our job then is merely a matter of meeting those. There is no substitute for working directly with the customer on his product and in our mill to tailor the product to his requirements.

How Does This Work In Practice?

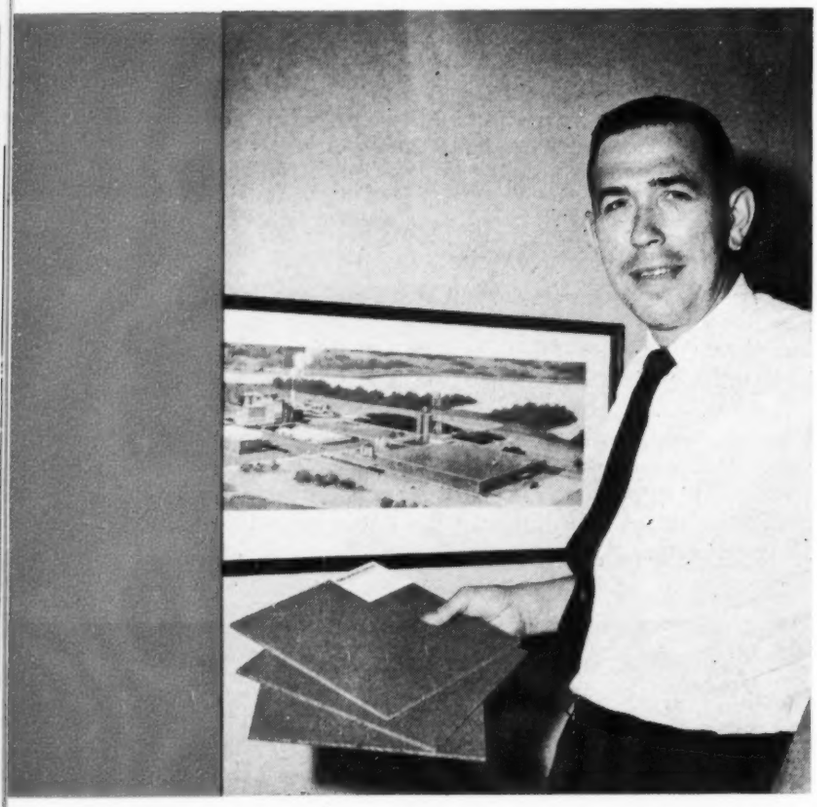
We like to send our technical liaison man into the customer's plant to develop a board to meet his special needs. We like to talk with his operating and technical people. We want to see how he is using the product and learn what tests he is making, what problems are involved in his process, what the realistic specifications will call for so we can work intelligently toward a product which will perform exactly the way the customer wants it to perform.



Tolerances can be reduced to 0.005" in this special version of the Yates-American S-53 triple belt sander at speed rates up to 90 fpm under normal production schedules.

In the development of a new product, we have a special line for producing 2-ft. x 2-ft. working samples. This enables us to make economical working tests which would not be possible if we merely cut small samples from large sheets of standard production board. We can make small samples of a wide variety of different kinds of board, tailored to specialized requirements, without affecting our main production line.

Running a new product like that on the high-speed main line is not feasible. We would have to run several hundred thousand square feet to be reasonably sure that we have a true, representative production run. This should not be the customer's



"We can make small samples of a wide variety of different kinds of board, tailored to specialized requirements without affecting our main production line."

worry but ours. It would be our problem to make the experimental runs and dispose of the odd lot irregular material through other channels.

So we like to work out the bugs in the 2-ft. square samples before we make runs on the big machine. We will go all out in helping the customer with his research and development program. We have the technical staff whose sole job is to follow up this kind of problem. They will stay with it until the problem is licked or until the customer gives up on what he is trying to accomplish.

That is exactly the type of business we set up this plant to serve. We know full well that to sell an industrial customer on a board we first must provide him with a board which is suitable for his operation and provide it at a cost which he can afford to pay.

We have a sales group constantly looking for potential customers, not only those who are using hardboard, but people who are utilizing a panel material of any kind in applications where we think our hardboard would be better—either at a lower cost or for better performance. Whatever it may be we are ready to tackle the problem of tailoring exactly what the customer wants, what he can use, and what he can afford to buy.

When Is Hardboard Preferred Over Other Materials?

There are many applications in which hardboard has proved to be a more satisfactory material, otherwise it wouldn't be used. But, there are not enough people yet familiar with its possibilities. They still think of hardboard as being a substitute drawer bottom, dust panel or case back.

TV cabinet manufacturers have been more progressive. A large percentage of TV cabinets are produced from hardboard with a printed grain finish. The "cases" are built entirely of hardboard with no surface or reinforcing laminates, only solid hardboard bonded to a wood frame with the ornamental surface finish applied.

As we have already discussed, hardboard cross banding is far superior to other types and opens up new possibilities for economy on core construction. Before a manufacturer can go far on economizing with his core the first thing he must do is utilize a better cross banding material. Thin, high-density hardboard is his answer.

For thin section plywood, hardboard is the ideal core material, especially in three-ply construction, for the same reasons that hardboard cross band is good: no telegraphing.

What Is Your Personal Outlook?

No one in the hardboard business is particularly enthusiastic about selling boards for dust stops and dividers or case backs. There is nothing very challenging about that! I would like to see all of our board going into highly critical uses.

We might as well set a real goal for ourselves. It offers more of a challenge and it provides more satisfaction in producing a product for that purpose. Let's face it. There are many things in sheet form which can be used in the same applications. But, I think all of us in the industry would like to look ahead to the day when hardboard is no longer considered a substitute material but is such a good material in itself for many basic applications that it will be preferred as a primary material because of its properties.

This mill was built with space for a second machine. I would like to see that second machine installed. Because of the flexibility of our dry (air) process and the fact that we are in business to tailor a board to the customer's needs, regardless of his specifications, I expect to install that second machine in the near future. After that, I will look forward to production of a million square feet of hardboard per day.

Among the major equipment suppliers to Bowater are the following firms:

American Defibrator, Inc., New York, N.Y.—Cooker

American Manufacturing Co., Inc., Tacoma, Wash.—Press Charger and Press Receiver

Bauer Brothers Co., Springfield, Ohio—Refiners

Buffalo Pumps, Div. of Buffalo Forge Co., Atlanta, Ga.—Pumps

Chemical Linings, Inc., Watertown, N.Y.—Chip Silos

Cochrane Corp., c/o Dickey Engineering Co., Knoxville, Tenn.—Condensate Pump

Crane Co., Knoxville, Tenn.—Condensate Receiver

The Day Sales Co., A Subsidiary of the Day Co., Minneapolis, Minn.—Air Systems

Dings Magnetic Separator Co., D. F. Scarbrough, Atlanta, Ga.—Magnets

Food Technology, Inc., Chicago, Ill.—Lab Equipment and Humidity Cabinet

The Foxboro Co., Knoxville, Tenn.—Pressure Controller, Gas Meter, Flow Element and Control Instruments

Gardner Laboratory, Inc., Bethesda, Maryland—Laboratory Equipment and Oven

General Electric Co., Chattanooga, Tenn.—D. C. Drive, Cable - Feeder, Power Control, Limit Amp Switchgear, Medium Voltage Starters, Metal Clad Breakers, Medium Voltage Control Centers, Operator's Benchboard, Recording Watt-meters, Selenium Rectifier, Substation and Transformer

R. Hoe and Co., Inc., High Point, N.C.—Saws and Breakup Heads

Jacksonville Blow Pipe Co., Jacksonville, Fla.—Waste Hog

Johnson City Foundry and Machine Works, Inc., Johnson City, Tenn.—Turntable Slide Tables, Caul Dip Tank, and Hardboard Off Bearing Carts

Kings Mountain Welding Shop, Kings Mountain, N.C. —Caul Attachments, Caul Repair Table and Screw Feeder

Kirk and Blum Mfg. Co., Cincinnati, Ohio—Refiner Operator's Control Panel

Link-Belt Co., Atlanta, Ga.—Chip Elevator and Chip Silo Feeders

Materials Handling Equipment Co., Chicago, Ill.—Screw Conveyors

Matthews Conveyor Co., Atlanta, Ga.—Flash Drying Duct Supports

Mereen-Johnson Machine Co., Minneapolis, Minn.—Rough Edge Trim Saw Unit and Panel Saw

Mixing Equipment Co., Edgar A. Rogers, Chattanooga, Tenn.—Mixer

B. L. Montague Co., Sumter, S.C.—Press Doors, Caul Plates, and Wear Plates, Drive, Support Lines and Cyclones, Press Support and Roof Monorail, Pulley and Idlers, Bearings, Log Flume Extension and Structural Steel

Moore Dry Kiln Co., North Portland, Oreg.—Transfer Car, Board Handling and Humidification Equipment, Board Cooler and Conveyors

D. J. Murray Mfg. Co., Wausau, Wisc.—Chipper

The Oilgear Co., Cincinnati, Ohio—Press Hydraulic Oil Pumps

Rader Pneumatics, Inc., of Tennessee, Memphis, Tenn.—Pneumatic Feeder and Trim Waste System

Reliance Electric and Engineering Co., Atlanta, Ga. —Drive Motors, Press Pit Sump Pump, Pump Motors, Induction Motors

Edward Renneburg and Sons, Baltimore, Md.—Flash Drying System

J. O. Ross Engineering, Div. Midland-Ross Corp., New York, N.Y.—Heating and Ventilating Equipment

Testing Machines, Inc., Mineola, N.Y.—Laboratory Instruments

Toledo Scale Co., Charlotte, N.C.—Laboratory Equipment, Scales

Washington Iron Works, Seattle, Wash.—Forming Line Equipment and Press

Williams Patent Crusher and Pulverizer Co., Inc., St. Louis, Mo.—Fiber Classifiers

Wilson Wire Works, Kearny, N.J.—Felter Wire

Yates-American Machine Co., Beloit, Wisc.—Sander

Part II in our October issue will present a detailed plant tour to show the complete operation at Bowater.

Double End Tenoner: Most Versatile Woodworker

Part III

By Paul H. Graham
Contributing Editor

In the first two articles, Paul Graham has covered historical background, the different types of machines, case histories of installations included in the survey, and mechanical details of general interest to all who are concerned with tenoners.

For Part Three, more specific details of the tenoners surveyed explore the power drives, methods of control, and a wealth of tooling arrangements which will stimulate the imagination of any good mechanic. They may even suggest methods or operations profitable enough to warrant investment in new equipment.

The next issue is scheduled to bring you a summation of specific applications examined and a look into future developments for the double end tenoner.

MOST of the tenoners observed were all-electric machines, operated by electric motors, usually direct-connected to cutterhead or saw spindle, controlled by push buttons and switches. Wiring was enclosed in heavy conduits in the machine base or, where unit adjustments were required, in flexible conduits free to coil and uncoil as adjustments were made.

All motor wiring was interlocked to protect machine and operator. Automatic magnetic switches and switches of overload relay and low-voltage release type would stop all motors when a single motor cut out for any reason. Master stop buttons stopped all motors instantly. Lever locks prevented accidental starting while the machine was being set up or adjusted.

Most tenoners had push button controls in the master panel, one for each motor, so that the operator could change settings and start or stop the machine without leaving his operating station. Start, stop and jog buttons also were placed at the outfeed end of the machine for convenience and safety. Some tenoners placed start and stop buttons at other strategic points around the machine for emergency use.

Most motors were ball bearing units, either a semi-enclosed type of motor with through-type ventilation, or totally-enclosed fan-type motors. A single double end tenoner mounted anywhere from 9 to 20 separate motors, depending upon the number and kind of attachments and accessories used. The basic tenoner usually carried nine motors: two cut-off saw motors, two cope spindle motors, four tenon head motors, and one feed motor.

Traverse mechanisms generally were operated by fractional horse-power motors. Feed motors ranged from 2 to 3 h.p. Cutting head and saw spindle motors usually were 5 h.p., although larger motors of 7½ to 10 h.p. were used for special requirements. Special heavy duty tenoners at an insulation board plant carried heavy cutterheads weighing up to 125 lbs. driven by 25 and 30 h.p. motors turning up to 7200 r.p.m.

Scoring saws for plywood jobs were driven by fractional horsepower motors, usually ½ and ¾ h.p. Smaller tenoners for general work mounted 5 h.p. trim saw and cope motors, 3 h.p. tenon motors, and a 2 h.p. feed motor. The normal operating speed of most motors was about 3600 r.p.m. but high frequency converters and other arrangements provided operating speeds up to 7200 r.p.m. to meet special requirements.

Basic cutting equipment included: tenon heads for cutting tenons, either wing-type or round cutterheads with knives set diagonally, mounting spur cutters for a clear shoulder finish; coping heads for coping the tenon shoulder; square or round cutterheads with knives bolted or clamped to the cutterhead; and circular trim or cutoff saws for cutting tenons to the proper length.

Three-wing tenon heads were standard in 8 or 8½ in. diameter and 3¼ to 3¾ in. face for single heads, or 6½ or 7½ in. double face. Round heads and thin knives instead of wing-type heads seemed to cut more easily and require less power for driving on some jobs. Smooth-faced spurs with teeth ground or filed at a back level were used for cutting hardwood. Serrated-face spurs for softwood had serra-

tions milled into the face side to produce a series of knife-edged teeth when a simple bevel was ground on the back. Side edges of the spurs were beveled to slip easily into the cutterhead's beveled edge seats. The edges were milled to provide adequate face clearance against the cutting shoulder. The major function was to score or cut across the wood fibers and produce a smooth-cut shoulder when set ahead of the knife-edge cutters.

Some coping heads had a knife arrangement that permitted width of cut to be adjusted without changing the size of the tenon stub left standing. They also allowed tenon thickness to be adjusted easily without changing the coping cut. Inserted-tooth copes and coping bits were used.

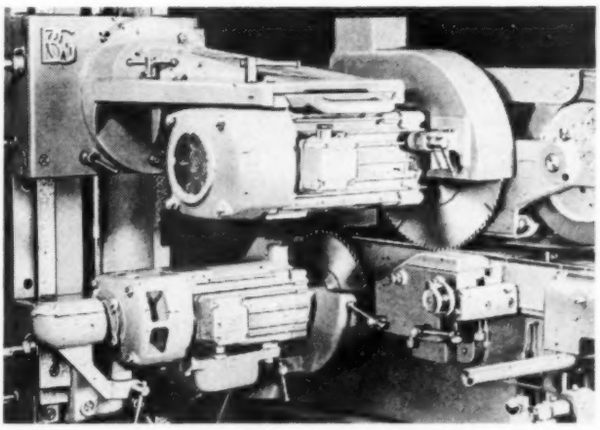
A special tenon head designed to chamfer the ends of tenons had small cutters mounted in the head to make a V-cut across the tenon. The tenon was trimmed by the cut-off saw through the center of the "V." Another head was fitted with circular-type milling cutters arranged to give a shearing cut. A saw in a flange section served as a spur.

Cut-off or trim saws usually were 12 or 14 in. in diameter, both conventional-type and hollow-ground. Relatively stiff saw blades were preferred to avoid run-out when cutting through dense wood, glue lines or knots. Carbide-tipped saws were favored for cutting plywood, laminated or edge-glued stock where abrasive glue lines were encountered.

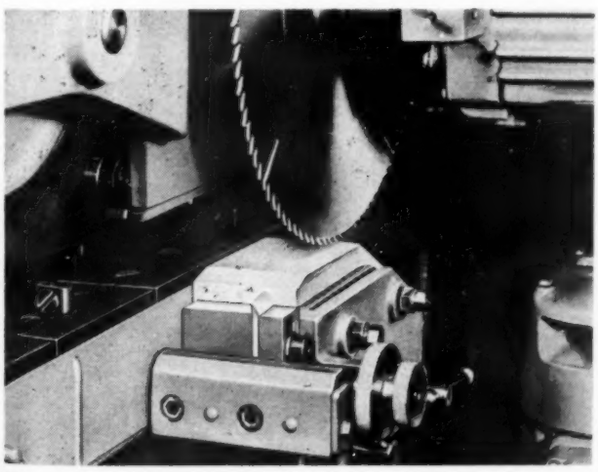
Cut-off or trim saws usually were mounted on ways or slides on front of the headstock columns. They generally mounted direct to the motor spindle. Some saws were swivel-mounted on yokes with two-directional slides for easy, accurate adjustment. Saw yokes with locks and an internal slide permitted position locking after adjustment. Saw posts were well-rounded. Some tenoners had tie bars extending across the top, the same as the saw posts. Vertical adjusting gears were enclosed within the tie bar casting.

Vertical saws usually were adjusted by handwheel controlled screws above the vertical slide. Handwheels at the side controlled horizontal and tilting adjustment. In a typical installation, saws were tilted by an internal worm and gear segment. The saw motor was held up to the face at both the pivot point and tail end. Another had the motor housing pivoted on a horizontal slide with square gibbed ways. Convenient graduated scales and dials permitted accurate adjustment. Some tenoners had vertical, horizontal and tilting adjustment at the operating end of the machine where indicators and saw motors both could be seen.

Vertical and horizontal saw adjustments ranged up to 8 in. The saw units were tilted to 45 or 90

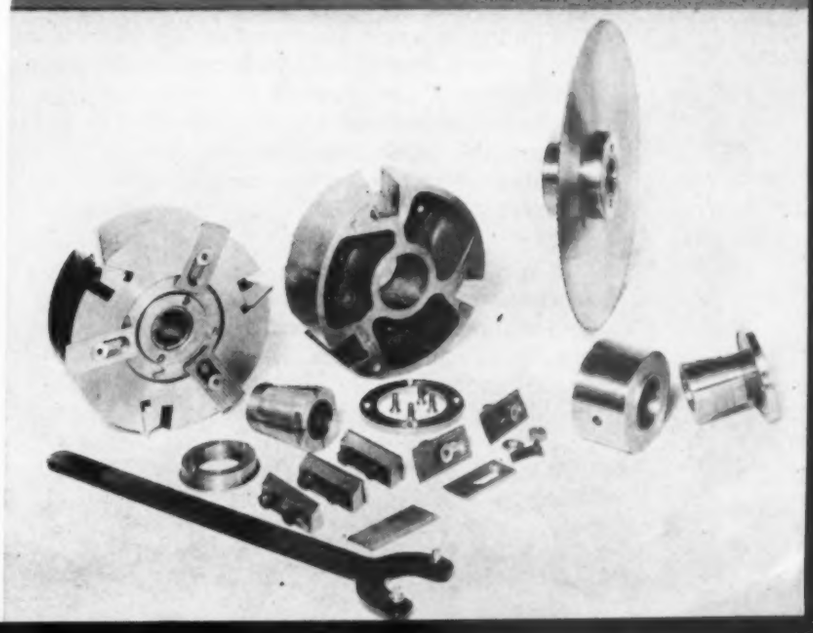


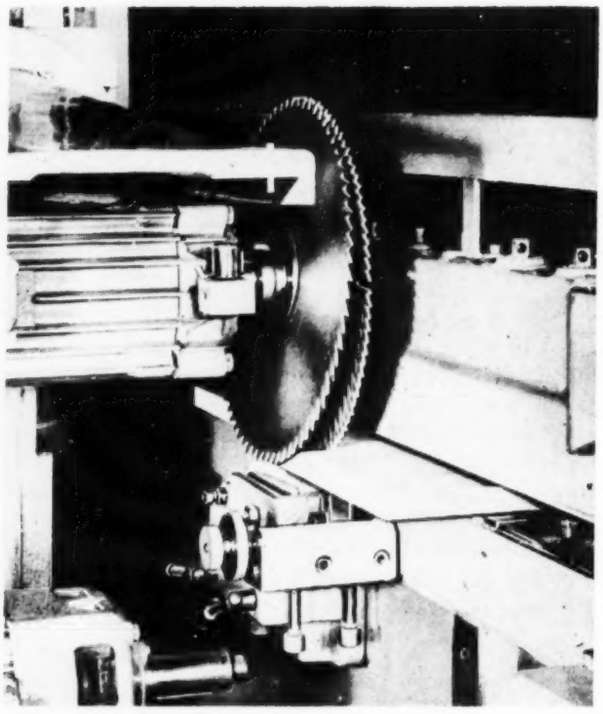
Trimming with upper and lower saw, with upper saw drawn forward to make room for lower saw.



Trim saw operates over wooden support and scratcher.

Tenon head assembly and circular trim saw with self-centering collars.





Trim waste is reduced by wobble saw next to trimmer, adjustable to width of the trim.

degrees up and down. While the saws usually cut from above, they could be arranged to cut from below. Non-tilting saw spindles also were used. The saws could be moved more to the front to cut extra wide stock of random lengths.

Cutter fouling by trims was prevented by hogging or refuse cutters to reduce end trim to particle size during the sawing operation. Where these auxiliary cutters were employed, chipbreaker shoes were attached to the pressure beams. These shoes were adjustable vertically and endwise for proper location.

Tenon units were mounted on vertical dovetail ways between upright members of the headstock columns. These usually were self-contained motorized assemblies on a single stand with ample room for full vertical and horizontal adjustment from rack and pinion or screw movement and crank or handwheel. Some tenon heads were mounted on motor spindles with self-centering sleeves. Adjusting cranks or handwheels were located above or at the sides of the heads, sometimes at the ends of the machine where heads and setting scales both could be seen.

A very important feature was a vertical adjusting mechanism to permit simultaneous movement of upper and lower tenon heads while maintaining a specific tenon thickness. The heads also could be moved independently of one another. The heads could lock in position after exact setting adjustment.

While many tenon heads were designed to be operated in a fixed position, tilt was supplied to some tenon slides to permit adjustment for special operations such as chamferring and scarfing, up to 22½ degrees either way. Other adjustments varied with tenoner but ran as much as 12½ in. vertical adjustment for the top head and up to 8 in. for the bottom head. Horizontal adjustment ran as much as 8 in.

A tenoner of foreign make did not have its cutters mounted on horizontal spindles. Instead, vertically-mounted face cutters permitted tenoning, rabbeting or molding to be done with the same cutterhead. Mounted on vertical spindles for cutting tenons, the same cutters also were used for undercutting and other operations, eliminating the need for separate spindles with special cutters. The tenon cutters were mounted on tilting spindles for cutting angle tenons. The motors had a rotary mounting for tilting to any required angle.

Some tenon motor carriages were machined to permit the use of scoring saws with the tenon head unit. Scoring saws, which cut through the face veneer of plywood ahead of the tenon cutters to prevent tearing, usually ran with the feed to cut cleanly and accurately. They often were mounted directly

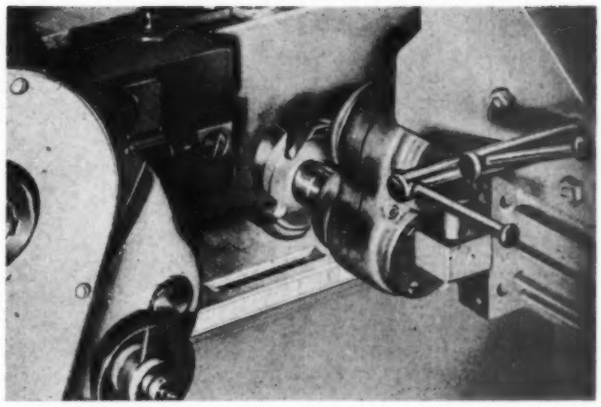
Moulding unit driven by lower rear spindle motor used for grooving and shaping also produces stopped grooves and tenons when connected to limit-switch controlled magnet.

upon the tenon motor housing. This permitted adjustment of tenon units without readjustment of the scoring saws. Independent vertical and horizontal adjustment also was provided for scoring saw units, allowing vertical adjustment up to 1½ in. and horizontal adjustment up to 5 in.

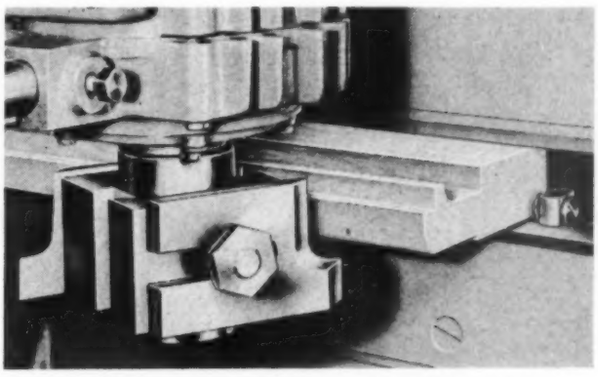
Independent scoring saw units also were mounted on the headstock columns in front of the tenon carriages. These were motorized units carrying scoring cutters or small-diameter hollow-ground saws. Most units had independent vertical, horizontal and tilting adjustment, usually controlled by hand crank and screw for fine adjustment without disturbing the saw or saw collar.

Cope heads were similar in design to tenon heads, usually mounted on the rear of the headstock column. Besides coping tenons, these heads carried various inserted-tooth grooving cutters, moulding cutters, and milled-to-pattern cutters for grooving flush doors, edging and sizing doors of various types and sizes, and grooving assembled sash to eliminate the need for hand fitting. Cope spindles carrying moulding cutters were used to cut lock joints. These were tilted to make the required angular cut. They also were used with saws to slot faces of miter cuts. The copes were tilted to correspond to the miter cut angle. Various special attachments were swung from the cope spindle.

Cope heads produced many edge shapes with suitable cutters. Head diameters varied with operating speed, ranging from about 5 to 9 in. in most applications. Large diameter heads generally were used for lower speed operations. Minimum distance from center of cope spindle to edge of chain varied with size of motor from about 4 to 6½ in. A maximum amount of holddown while coping was obtained in a tenoner where the distance from the center of the cope spindle to the center of the drive shaft was about 22 in.

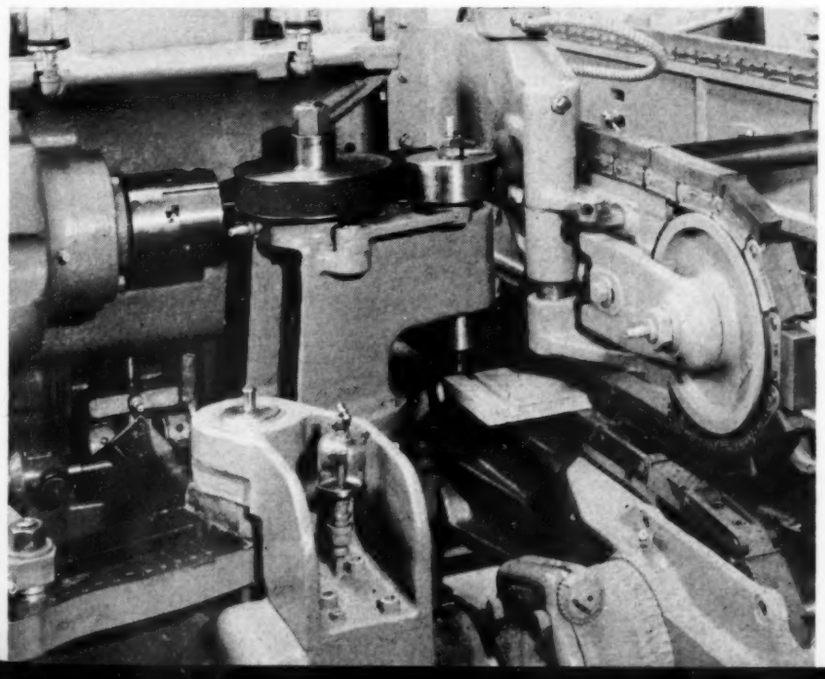


Moulding unit turned 90 degrees to cut grooves in face stock.



Stock held between live overhead rubber belt pressure unit and feed chain while heavy profiles are applied.

Normal operating speed of cope heads was about 3600 r.p.m. But, high frequency converters and other high speed devices provided speeds of 6000 and 7200 r.p.m. for moulding and shaping. One tenoner had its cope spindle driven at high speed by a V-belt drive in which belt tension was eccentrically adjusted.



Belt driven at 13,800 r.p.m. from cope with long detachable top this vertical dovetailing attachment can be easily removed for regular work.

WHEN YOU'RE IN THE WOODS

ON UREA RESINS

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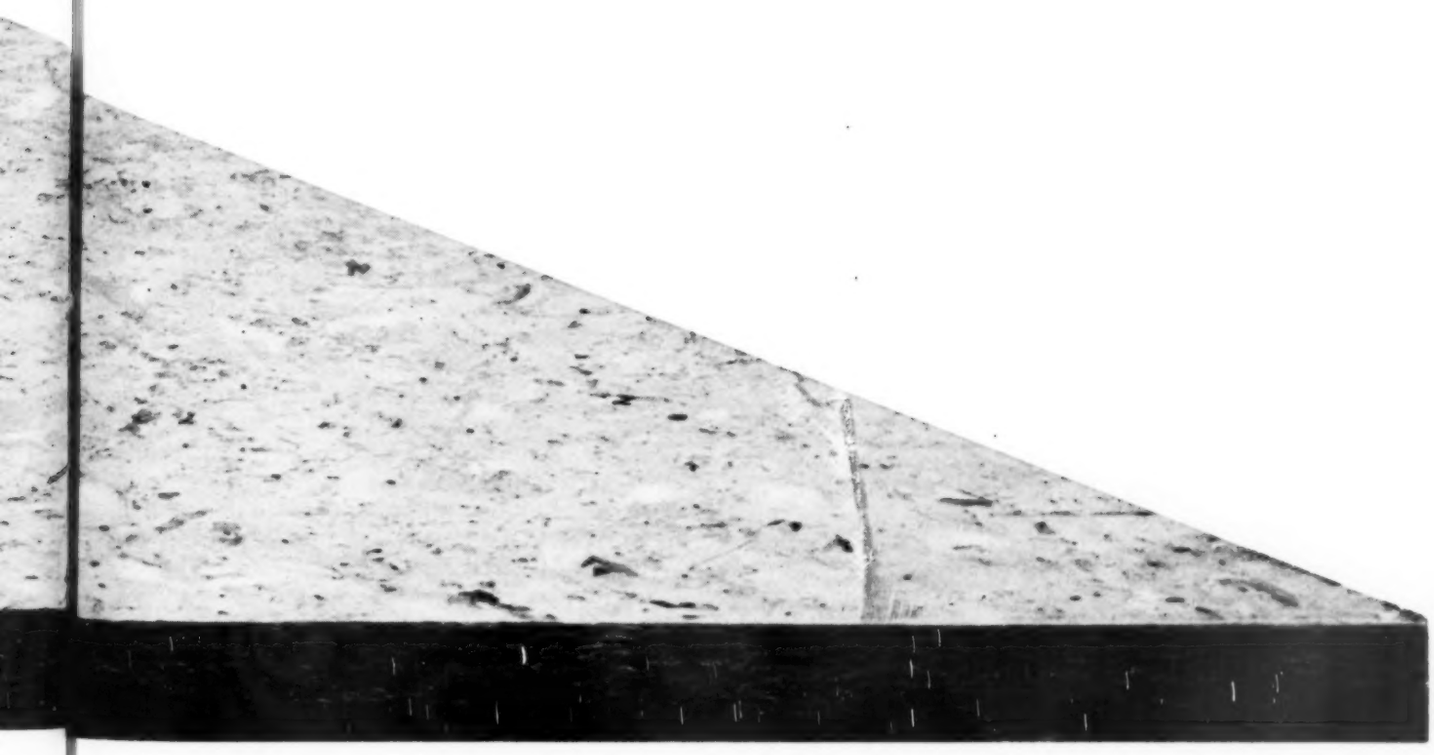

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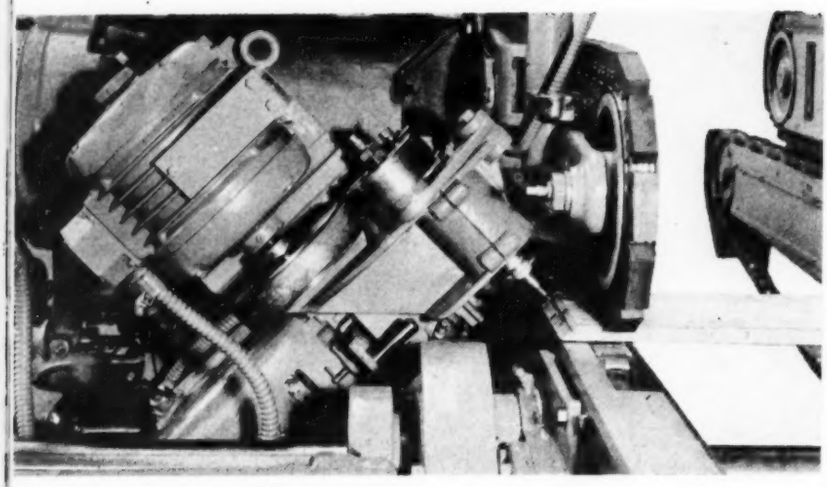


Angle dovetailing attachment used to dovetail miter faces is driven from motor on cope housing.

All cope heads had vertical and horizontal adjustment. Many also had tilting adjustment. One tenoner had its horizontal slide carry vertical ways and slide for vertical adjustment. The motor housing was pivoted on this slide to allow tilting for angle cuts. A locking device through the motor housing locked the spindle while the heads were being changed.

Vertical adjustment of cope heads went as high as 4 in., horizontal adjustment to 8 in. Adjustment usually was by crank or handwheel geared to a screw, often going directly through the center of the slide to prevent binding or sidewise pull. Horizontal adjustment was made by screw direct to the slide. Locks were provided on slides to hold the adjustment as set. Cope motors were provided with brakes and spindle locks.

Many tenoners provided cope head tilting adjustment of as much as 45 degrees away from the beams or 10 degrees toward them. Tilting usually was controlled by crank, handwheel or ratchet lever connected to a helical pinion or screw working in a large gear segment. The pivot point of tilt was kept up near the cutterhead. This eliminated overhang, reduced the effect of tilting on the position of the cutterhead, and simplified adjustments.

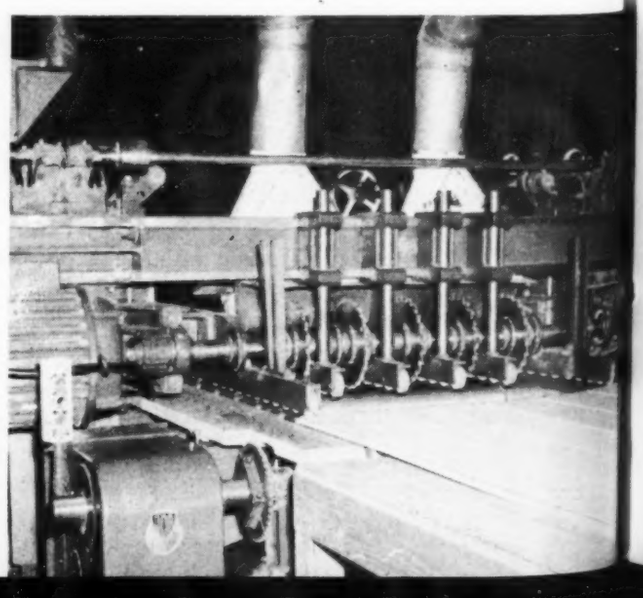
Various work positioning and stock centering devices facilitated accurate feeding of stock to the cutters. A veneer gage device centered panels with matched veneer faces. It was essentially an overhanging pointer arranged to center on the joint or set at equal distances from butt veneer joints to line up the panel feeding into the machine.

A long handwheel adjusted fence, called a lumber gage, was installed at the front of the left-hand chain beam to line up solid stock. Other squaring devices were attached to the chain or beam.

A wide variety of attachments, accessories and special cutters perform operations which could not be done with the basic cut-off saw, tenon and cope units. Special overhead cross beams and support shafts, cross bars between chain beams, and separate support stands and spindle extensions were used to carry these attachments and accessories. Various cutters operated from the bottom between the chains of the machine. Adjustable bottom support tables were provided for machining thin stock. Various attachments and their components were actuated by cams, compressed air cylinders, magnets and limit switches.

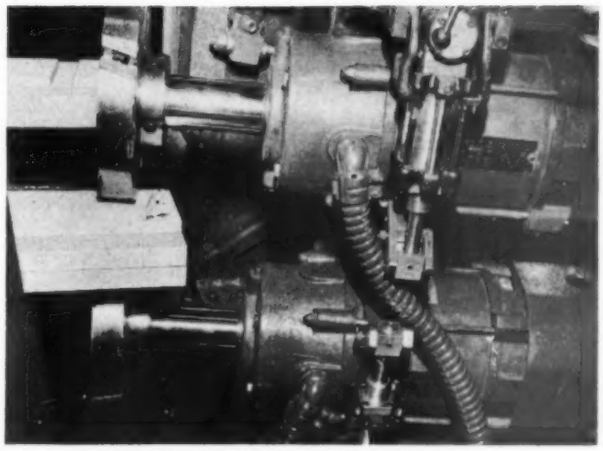
Overhead beams, support shafts and shorter supporting arms carried units for dadoing, grooving and routing. Overhead router, jump dado and dowel boring attachments often were mounted to overhead cross beams which swiveled axially 180 degrees when attachments were not in use. Other beams and shafts were stationary but the attachments were swivel or cleeve-mounted to swing as required.

A foreign tenoner used a swivel overhead cross beam carrying dovetailed ways in which dado, grooving and routing attachments were mounted in two-directional slides. A horizontal spindle in the slide mounted a sprocket at one to engage a rack in the cross beam. When the sprocket was turned by a crank the cutters were shifted into selected position. The cutter spindles plugged into sockets on both sides of the beam. Connections were made by cable run through the beam bearings. Spindles



A double end tenoner set up for a multiple dadoing and slitting to produce textured panels in addition to conventional operations. The 40 h.p. upper dado assembly can carry as many as 11 cutting heads.

View of infeed end of tenoner designed for sill and frame work shows stock feeding to special angular jumping tenon arbors used to machine inside and outside



were engaged and disengaged automatically through magnets controlled by special limit switches mounted on a bar.

The most universally used of all attachments for the double end tenoner probably was the dado attachment, either of the stationary or automatic jump type, which was designed to cut straight or angular grooves in the stock either in between or outside of the pressure beams. Straight grooves were made continuous, open at one end and stopped at the other, or blind or stopped at both ends.

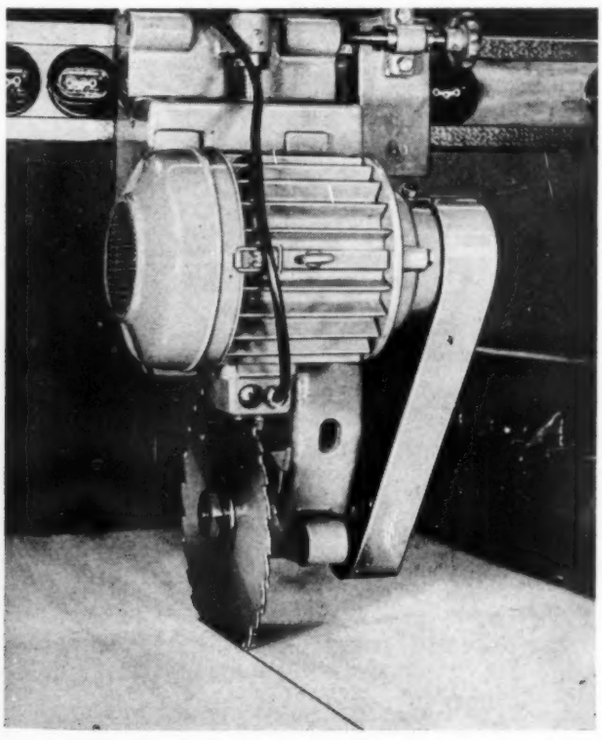
Dado heads were lowered to cut a groove of the required width and depth in stationary work, or where controlled by automatic devices to jump into the cut at a precise moment and jump out at a preset point. Angular dados were made by units which lowered into the stock, moved diagonally across the work, jumped out of the cut, and returned automatically to their starting position.

These dado attachments usually were supported from an arbor on a heavy overhead beam designed to provide a substantial mounting. The dado shaft was arranged to overhang the stock as it passed through the machine and extended to full width of the machine. It was sometimes arranged to pass through the motor to allow the cutters to be changed from either end. Some machines were arranged so that the entire dado shaft could be removed as a unit to permit quick changes without interference from the holddowns. Dado motors were mounted on their own stands with ample room for adjustment. They usually were 7½ and 10 h.p. motors, controlled by push button on the chain beam.

Jump dado attachments were converted for stationary dado work by disengaging the jump mechanism. The major jump arrangement was controlled either by a cam mechanism or compressed air cylinders. The location of the jump with respect to the chain dogs was adjusted by rotating the cam hub on the chain shaft and locking it in the correct position. The adjustment of the jump mechanism was controlled by crank, lever or handwheel on top of the jump arm. In most cases the arbor was arranged to jump automatically on 16 to 32 in. of chain travel and the use of special back gearing increased the jump up to 48 and 60 in. for special dado jobs.

In a typical jump mechanism a roller rode the cam to operate a rack and pinion located on the cam shaft to raise and lower the dado arbor. In another, cams fastened on the feed drive shaft transmitted movement through a roller and linkage to the dado motor and shaft. The jump cam, itself, consisted of two metal plates with a graduated adjusting ring to allow exact settings. Normal jump was about ¾ in. Vertical shaft adjustment was about 4 in.

One tenoner featured a special jump dado pneumatic lift device which permitted individual adjustment of dado motor, power shaft, dado cutter



Center splitting saw unit mounted on cross beam between chains separates wide stock into duplicate sections.

and cutter arm. The dado power shaft and motors were mounted above the holddown beam. The cutter lift arms extended downward into the stock passing. To take any cutter out of action, a locking pin was removed, the air cylinder disconnected, and the cutter arm raised above the holddown.

Electrical plug connections on the overhead beam allowed the dado cutters to be positioned as required along the length of the beam. Quick vertical positioning for depth of each cutter was accomplished by set-screw adjustment. Cutters were replaced easily.

Points of jump into and out of the cut were preset by the operator on a calibrated dial and the subsequent operation was automatic. The jump circuit was actuated or cut out by push-button control on the chain beam.

For most dadoing work a steady-rest support extended down from a large overarm above the dado shaft. Large holddown shoes prevented any flutter in the stock when dado cutters jumped into engagement or remained in the cut. Stock passed between lower supports and holddown shoes near the point of the cut. Lower stock supports kept long or thin stock from sagging under the dado cutters and the large spring-pressure holddown shoes prevented it from springing up into the dado heads. The lower stock supports were adjustable vertically to handle bowed or curved stock.

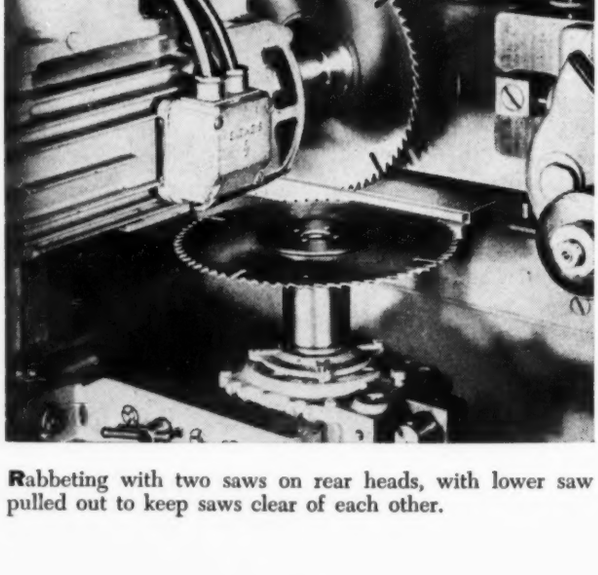
Extra steady bearings were used for extra long work. When chain beams were close together, they often were placed outside of the columns to support the ends of the dado shafts. A horizontal adjusting screw sometimes was provided to move the dado unit horizontally after the heads had been set up—either hand or power-driven. Vertical adjustment usually was by worm and worm-gear devices controlled by crank or handwheel.

A foreign tenoner used vertical grooving spindles mounted on an overhead beam extending the full width of the machine, or short arms for vertical router cutters fixed to the side frame. This arrangement was used only where the ends of the stock were to be grooved. The jump was operated by compressed air cylinders which lifted and lowered the cutters according to a preset pattern established through a special air valve control mechanism. Grooving spindles and their drive motors were rotary mounted for tilting or swinging the cutters up out of the way when not in use. Actual operation of the cutters was controlled by the stock feed to engage or withdraw them as required to make blind dado cuts.

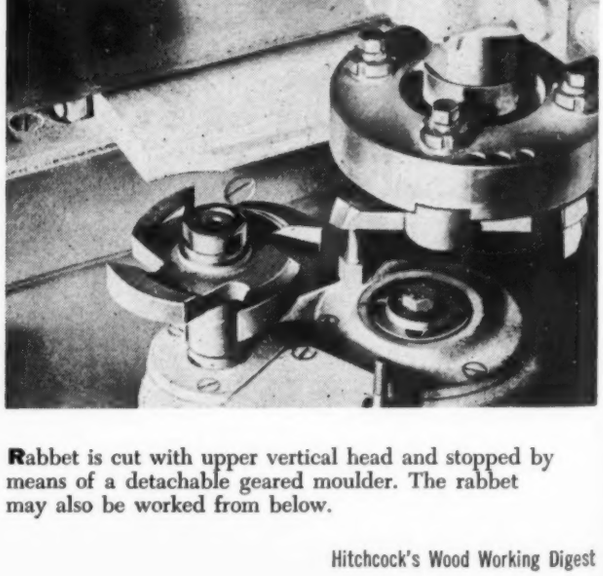
Another foreign machine had its dado cutters mounted from an overhead beam. Electro-magnets automatically engaged and disengaged the cutters. The magnets were controlled by limit switches mounted on a control bar to control the point of jump and length of cut before the cutters were withdrawn.

Some tenoners used a special set of dado heads operating from below to make all dados of the same depth on the bottom of panels regardless of any variation in stock thickness.

Dado heads, powered through a frequency converter, also were designed to use dovetail cutters to make dovetailed dados. The dovetail attachments of one machine were mounted on chain beams near the copes and were driven at speeds up to 7200 r.p.m. from removable pulleys on the



Rabbeting with two saws on rear heads, with lower saw pulled out to keep saws clear of each other.



Rabbet is cut with upper vertical head and stopped by means of a detachable geared moulder. The rabbet may also be worked from below.

cope spindle. An idler maintained belt tension. Another attachment to make dovetail cuts on the ends of the work at a 45 degree angle had a self-contained drive. It operated independently of the cope unit.

Most attachments required a straight groove of the desired depth and throat width to be cut first with a grooving cutter on the lower tenon spindle. The slot then was machined with a dovetail bit in the attachment spindle.

Various relishing and haunching attachments were used to relish on trim tenons to fit into blind dado grooves. They usually were mounted by brackets to the cope motor housing and driven from cope spindles. There action usually was cam-controlled. Relishing cutters were about 6 in. in diameter with a ½ in. face. Special hold downs extending well beyond the cutters held the stock securely during the relishing operation.

In a typical arrangement, the relishing attachment swung on the cope spindle from which it was driven by V-belts at about 10,000 r.p.m. Its action was controlled by a cam mounted on the feed drive shaft. Another attachment had its relishing cutter spindle driven at about 4800 r.p.m. from the cope spindle through an enclosed gearing. Action was controlled by cams geared to the feed drive shaft. A roller and linkage arrangement which transmitted the cam motion directly to the relishing cutters was arranged to swivel toward and away from the work. The cutters were fed into the work by a heavy spring and forced away by a cam and lever.

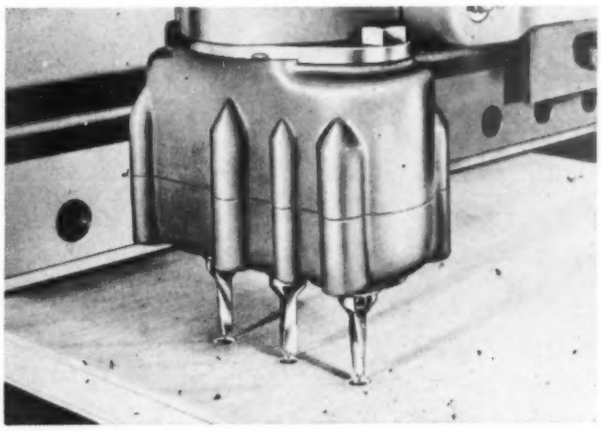
An automatic jump cope attachment for tenon relishing was driven up to 7500 r.p.m. by a V-belt drive from the cope spindle to a pivot shaft and on to the relishing spindle. A cam on the feed drive shaft held the cutters firmly in position for cutting. A heavy spring pulled the cutters out of action at the end of the cam rotation. This attachment was converted by an additional gear unit and housing for contour shaping.

A tenoner of foreign make employed an attachment for haunching tenons. This was mounted behind the last spindle and was carried along by the leading edge of the work. Mechanical control was supplied by cam action. The attachment operated continuously without interrupting the feed.

A universally adjustable metal cam on the feed drive shaft of some machines controlled the action of the relishing attachment and allowed the length of the relish cut to be set by simple adjustment. Other machines used cams made of wood, plywood or hardboard in shapes to accommodate both standard and special chain spacing. Standard spacings of 16 and 32 in. or 24 and 48 in. were commonly used but increased spacings, on the order of 32 and 64 in., were made possible by a special back gear. Attachment adjustments permitted relishing on two and four corners of the work.

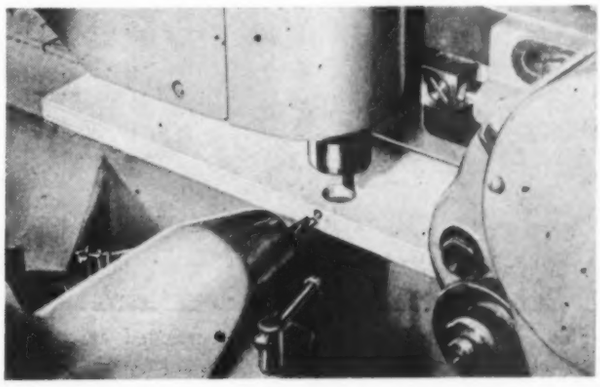
Special notching attachments were operated from the cope stations. Instead of being driven from the cope spindles, they generally were self-contained motor-on-spindle units driven by small motors, 1 or 1½ h.p., turning at about 3600 r.p.m. Their movement was controlled by cams, similar to relishing attachments, to make notches as deep as 1½ in. and as wide as 3 in. Notching heads averaged about 5 in. in diameter.

Cam actuation also was used in corner rounding and moulding operations for controlling the movement of special attachments. These attachments were mounted on the cope spindles and served to round rear corners of the work without interrupting the feed as stock passed through the machine. They were mounted on either or both sides of the machine. Cams determined the shape of the corner and form cutters provided various edge contours.



Multiple drill head attached to dado is actuated by a magnet timed by limit switches.

Horizontal drill attachment and overhead recess tool prepare stock to receive special metal joint fastener.

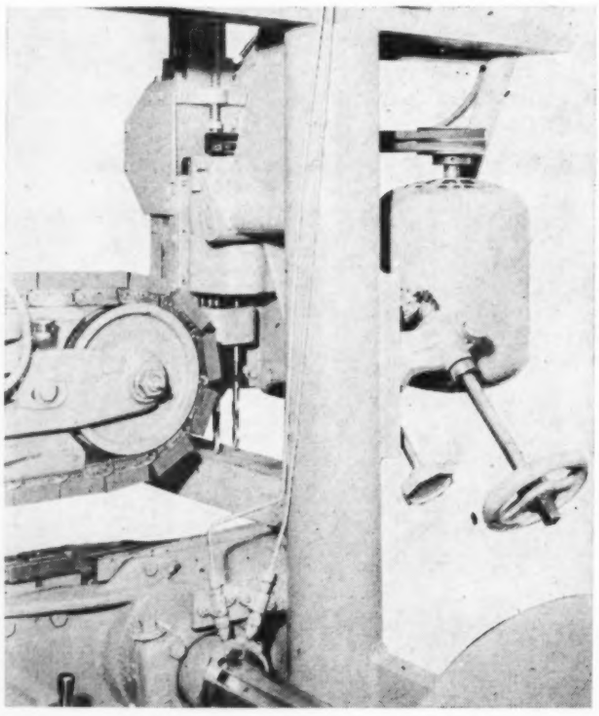


The attachment was arranged for automatic operation, actuated by the workpiece and controlled by cam action. Cutters in some installations were engaged and withdrawn by compressed air actuated by contact of the workpiece with a stop or switch connected to the air valves.

An automatic shaping attachment developed for the double end tenoner during the early 1950's shaped furniture and other panels with regular or irregular contours without preliminary bandsawing. This shaping was completely automatic and produced such irregular shapes as serpentine contours, ogee, oval and circular ends or sides, diagonal or rounded corners and scalloped motifs.

Where two of these attachments were used, one on each side of the machine, it was possible to shape both edges or ends. Each side or end could be provided with a different contour if desired. Shaping also was done on more than one piece at a time when the stock was stacked one piece above the other. Multiple-contour cutters were covered the full width of the stack.

The shaping units remained in fixed position and, therefore, did not interfere with conventional tenoning or coping operations. They had a maximum travel of 5 in. from the chain beam and permitted cuts to be made up to 3 in. in depth. About 1 in. vertical and 2¾ in. horizontal adjustment in relation to the chain beams was provided for these units. Round corners were cut with a maximum radius of 2½ in. and diagonal corners up to 5 in. in length were cut on the two leading corners of the work. Shaping was done with conventional shaper knives in slotted collar heads or milled-to-pattern heads.



This 2-spindle boring attachment is mounted at outfeed end of machine for automatic hole boring.

Cams controlling the motion of the shaping spindles were made from hardwood discs directly on the machine from a master pattern of the piece to be produced. A cam-forming unit was used for this purpose. It consisted of a motor and spiral cutter installed in place of the cam roller lever. The conventional shaper cutter was replaced by a roller. A collar of the same diameter as the shaping cutter was placed on the shaping spindle. As the master pattern was fed slowly through the machine, the cam-cutter automatically cut the cam outline in the hardwood disc to duplicate the pattern.

Actual shaping was performed by a cam roller, lever and segment gear assembly which transmitted the cam pattern to the cam spindle at a rate of travel synchronized with the speed of the feed chain. Work up to 60 in. in length was handled on a 64 in. chain spacing. Reduced variable feed rates, from 12 to 40 feet per minute, facilitated shaping of intricate work. The cam usually made one complete revolution to shape work of maximum length, but shaped workpieces 30 in. or shorter with 32 in. chain spacing at a rate of two pieces per cam revolution. Very narrow work was sometimes shaped at a rate of four pieces per cam revolution.

The automatic shaping attachment generally consisted of a cam operated gear case driven from the feed drive shaft, cam roller, lever and mounting bracket, and the shaping unit. In operation the cam roller, held against the cam by a counterweight, transmitted cam movement to the shaping spindle through a gear segment to move the shaping spindle to and from the work as required. The shaping spindle usually was driven from the cope spindle at speeds up to 7200 r.p.m. for fast and clean cutting.

Special boring or drilling attachments also were used continuously to bore or drill holes vertically, horizontally or at an angle automatically, without interrupting the feed. Many of these units were cam-operated and worked similarly to jump dado attachments. When not used for boring or drilling, many were used for top routing. They usually were installed at the outfeed end of the machine and operated with feed-speeds of 12 to 25 feet per minute for clean hole drilling.

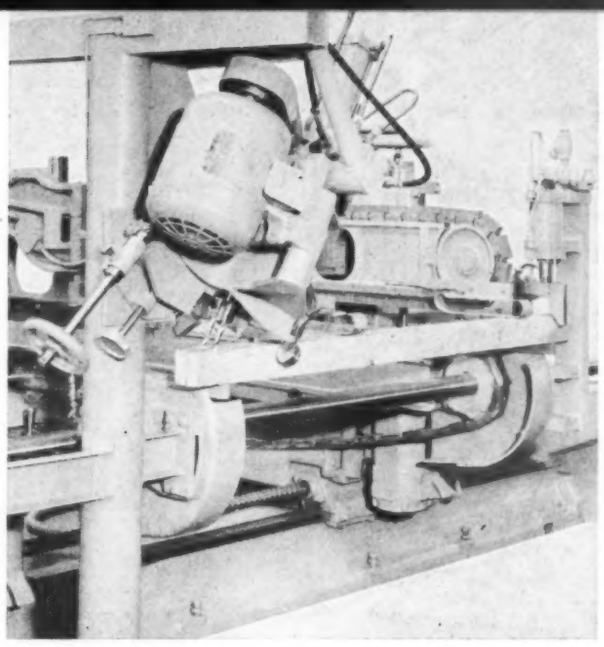
In a typical installation, drills or boring units were mounted on an overhead cross beam along its

width and were arranged to jump into engagement with stock moving on the feed chain below, move along with it for a short distance while completing the boring stroke, and then jump out of the hole. Some units with separate tilting units operated from shorter support arms. A few required the feed to be stopped during the boring or drilling operation.

Attachments with a flying arrangement eliminated feed interruption in drilling the holes. A stop was engaged by the moving stock to carry the boring or drilling spindles with it. Rate of feed was not affected. Compressed air cylinders engaged and disengaged the drilling attachment. Center distance and depth of holes were accurately and easily adjusted by means of stops or cams.

Magnet and limit switch controlled the drilling attachment in a foreign tenoner. It was actuated by stock passing through the machine. The leading edge of a panel tripped a special switch which cut in a magnet in the oil-hydraulic feed gear and immediately shut off the flow of oil into the feed motor to stop the feed chain. Special limit switches were set along a master bar to control hole spacing. Vertical and horizontal drilling units were engaged and disengaged by magnets controlled by these switches. Where a different pattern of holes was required, time was saved by the exchange of various bars with switches already fixed in preselected positions. Overhead drill units usually were secured to the dado attachment but horizontal drilling units were mounted to the side of the chain beams.

Other special attachments were used for special or combination operations. Center cutting saws mounted in the bed below the work divided wide

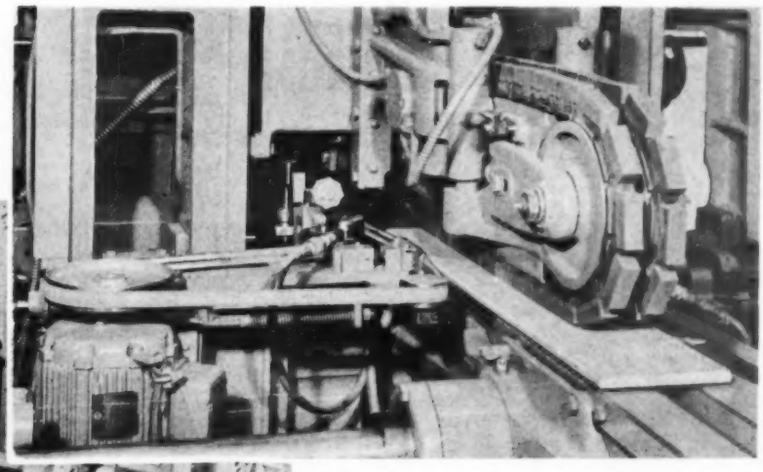


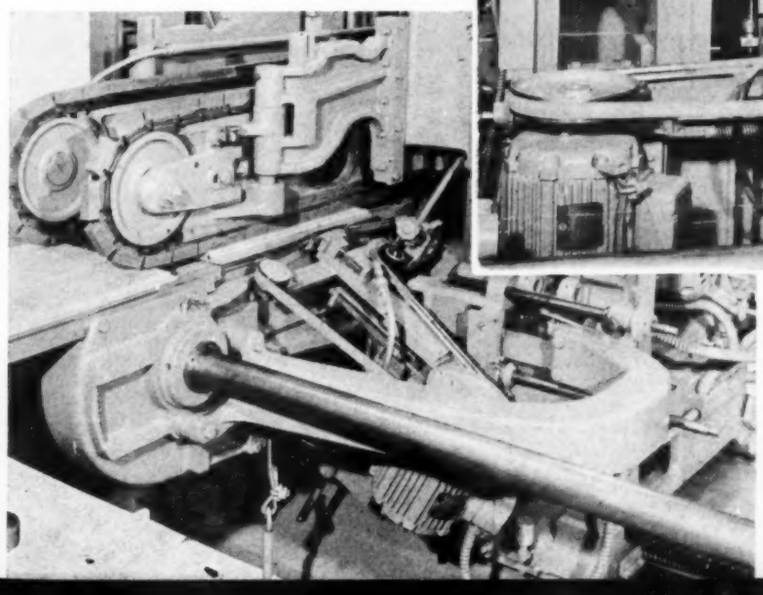
Two-spindle boring attachment arranged for angle boring by means of quick-tilting mechanism attached to rear column.

stock into duplicate sections. Sometimes they were carried from overhead cross beams or support stands. Narrow stock was occasionally separated by a circular saw on a rear spindle extending through the chain, driven by a separate motor. Some saws were driven from the stationary dado attachment. Edge sanding units were operated from the copes, using a round abrasive-covered pressure head or a sanding belt running around a pressure member. One machine featured an air-operated pressure block to eliminate rounding. A tenoner used to machine finger joints mounted a glue applicator at the outfeed end to apply glue to the joints.

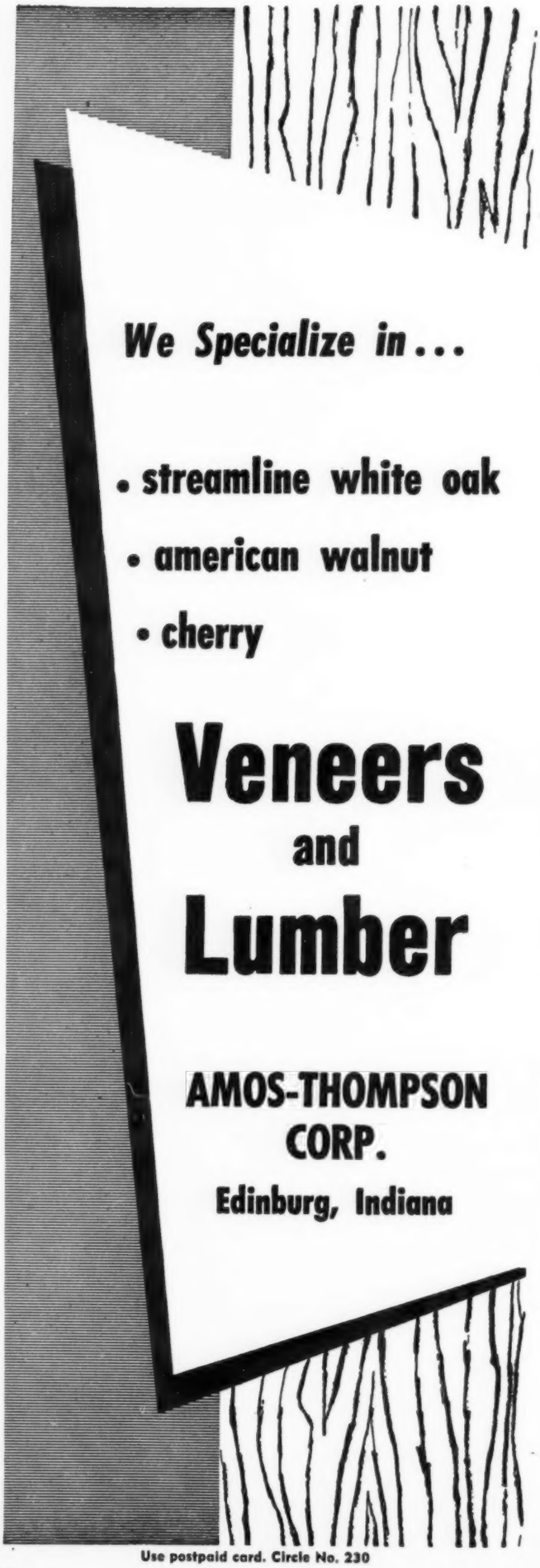
A foreign tenoner, developed in a country where mitered furniture construction is featured, machined furniture parts with concealed tenons and grooves. Instead of carrying the work to the cutters

Belt sanding attachment equipped with concave air-operated pressure block to sand round edge of panel.





A Tilting belt sanding attachment, mounted in standard cope unit position, uses an air-operated pressure block between pulleys to eliminate corner rounding.



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as in the conventional double end tenoner, the work was held stationary in this machine while cutters were moved past the ends of the stock. Air clamps held the stock securely along its entire width on both sides. Each cutting unit was moved forward and back by a 2 h.p. motor. The units themselves were powered by a 5 h.p. motor and spindles were driven by flat endless belt. The units had 3 speeds, up to 30 feet per minute.

No saws were used on the machine, only cutters. The cutter on the first spindle cut to size, tenoned and mitered. Cutters on this spindle were as large as 8 in. in diameter. The spindle turned up to 6000 r.p.m. The cutters on the second and third spindle had maximum diameters of 4 in. and 1½ in. respectively and were run at speeds of 12,000 and 18,000 r.p.m. These cutters shaped the tenons, grooved and performed similar operations while being guided by cams. All spindles had vertical and horizontal adjustment.

Each moving unit was mounted on a turntable, allowing the heads to travel past the work at any desired angle. Miter frames were cut to size, mitered and grooved in a single continuous operation. Panels for mitered case goods were cut to size, mitered and finished with concealed groove and tenons, also in one pass.

This machine was considerably limited in operation and did not have the versatility of the conventional double end tenoner. A plant using it for mitered case goods reported that good precision work was produced at a very reasonable production and operating cost. It was very easy to set up. Maximum length was 110 in. for panels and 98 in. for miter frames. Maximum width was 30 in. for panels and 7⅛ in. for frames. Maximum thickness was 2½ in. for both. Maximum length of tenon was 2¼ in. for panels and ¾ in. for frames.

Photographs for Part III of How Versatile Is The Double-End Tenoner were furnished by:

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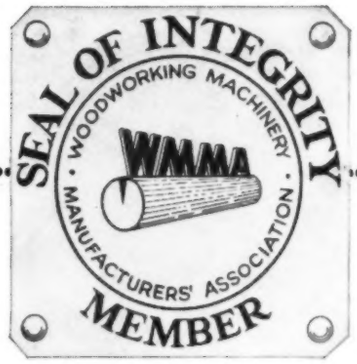

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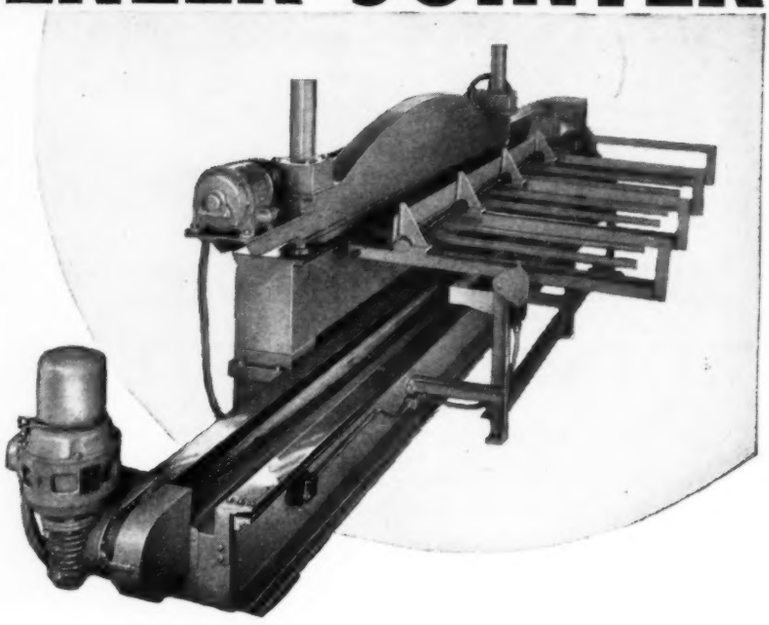

Traveling Head Eliminates Shifting —Makes Straight Joints

No chain feed—no stock wobble. It's the most accurate machine available for this type of work. Bundles of veneer up to four inches thick are firmly clamped in the machine. The jointing heads travel past the stock. Equipment includes four knife, round, roughing and finishing heads. Accessories such as swivel mounted roughing motor . . . mechanical loader . . . glue spreading attachment . . . head jointing attachment . . . dust piping . . . are readily available.

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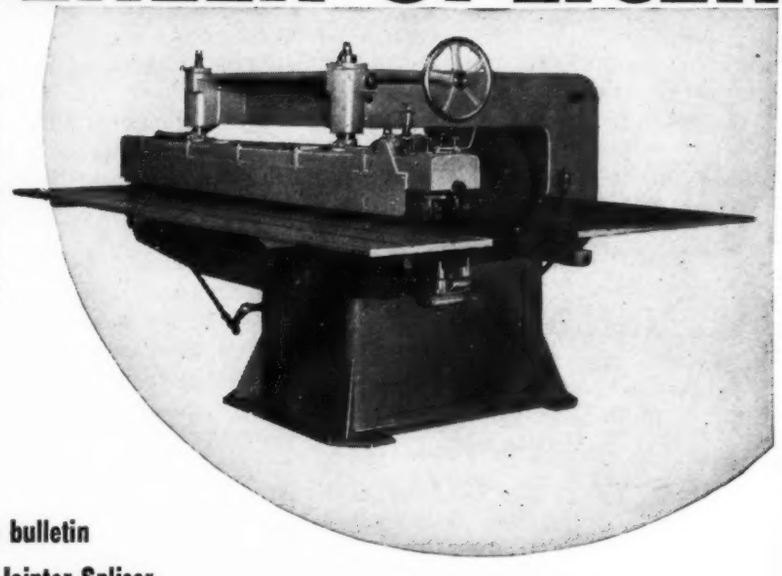
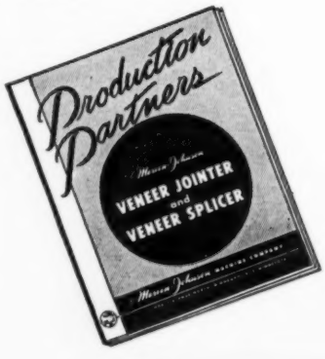


Precision tapeless joints—self-adjusting for varying thicknesses. About the only adjustment required by this machine is speed variation, regulated from 15 to 120 feet per minute. Either glue or catylist is applied smoothly and evenly by the revolving glue disc at the infeed end. Chains are self cleaning.



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Things Unheard Of

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KNOW YOUR WOODS has 384 pages and about 400 pictures. Included is an excellent full-color chart of 60 wood species and grain variations, which make cabinet wood identification easy.

The use of fine veneers is illustrated in this credenza or cabinet. Panels and doors of ⅛" Birch plywood are faced with crotch Mahogany and the borders with Tulipwood veneer.

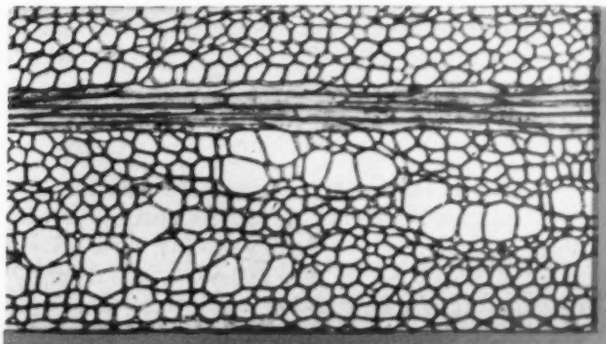
Albert Constantine, Jr., eminent author, authority on woods, and fourth generation lumberman. His great-grandfather founded family Fine-Cabinet-Woods business in 1812 while Napoleon retreated from Moscow.

About The Author

Albert Constantine, Jr. has been active in the lumber business for 40 years and he is a *Fourth Generation Lumberman* (!).

(Incidentally, we would be interested in knowing how many other fourth generation lumbermen or woodworkers are active to-day in our industry. Perhaps some of our readers can point them out to us.—The Editor)

This makes the author unique and worth listening to. His great-grandfather Thomas Constantine, a friend and neighbor of the renowned Duncan Phyfe, founded the family fine cabinet woods business in 1812—while Napoleon retreated from Moscow. Therefore, Constantine's book contains the distillate of 50 years of intimate knowledge of fascinating and unusual facts about the properties and qualities of all the commercially important species of wood, from Abura to Zebrano. Naturally such perennial favorites as Bullet Hole and Whisky Cherry Wood are included.

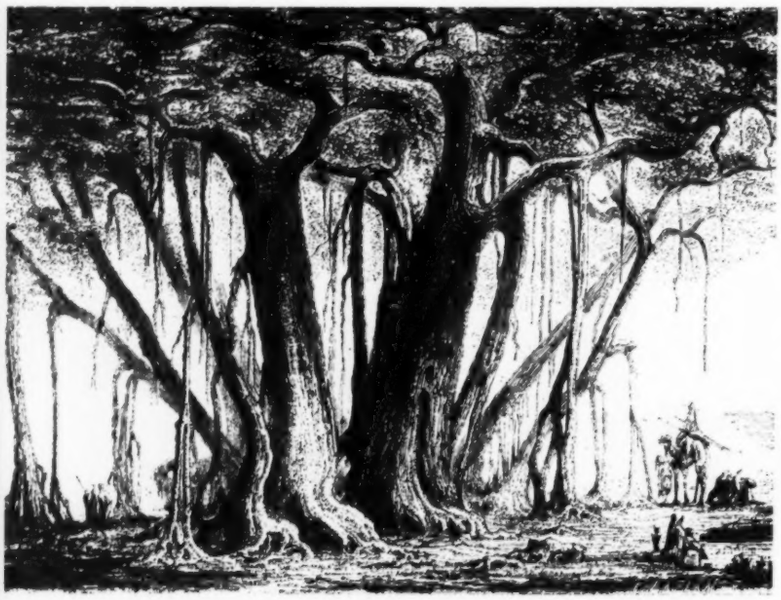


American Holly (Ilex Opaca) magnified 100 diameters.

Trees Without Tears

KNOW YOUR WOODS is written in a clear, non-technical style for enjoyable and informative reading. Therefore, everybody from boy scout to craftsman to foreman to nature lover to lumber or furniture salesman will find KNOW YOUR WOODS of practical use.

"Because," says Constantine:— *"Even today, with the tremendous emphasis on steel, concrete, glass and plastics . . . wood still maintains its importance as an essential commodity. The concrete building is constructed by employing re-usable plywood forms; the plastic in radio and television cabinets is strengthened with wood-fiber filler; wood is still uppermost as a construction material for small homes. More wood is being used today than ever before. . . ."*



Courtesy: American Museum of Natural History, N.Y., N.Y.

Trunks of the large Pagoda fig trees.

Industry Wide Benefits

Because there is very little sex, violence, brutality, murder or perverseness in this book, the giant publishing houses were not interested in handling it. Although it deserves to be, KNOW YOUR WOODS will probably never reach the best-seller list. No one will push it with full page ads in the Sunday supplements.

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The Ark of the Covenant was made from wood of the Shittim tree. Many Biblical leaders were great wood experts.

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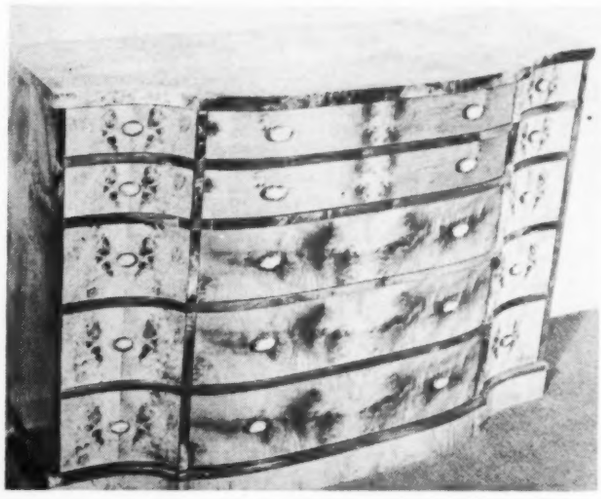
Program chairmen will be delighted, because some chapters are suitable for a full-scale discussion by study groups. There are chapters on *Woods of the Bible, State Trees, Drugs From Trees, Trees That Provide Edible Products,* and *Poisonous Trees.*

Not only botanists, or foresters, but clergymen, doctors, decorators, designers, historians or politicians can easily prepare an interesting talk based on the text and references of this book.



Myrtlewood in both veneers and solid wood were used in this credenza. Beautiful woods can often be bodly used in designing furniture of unusual originality.

Courtesy: American Museum of Natural History, N.Y., N.Y.

The Banyan tree (Ficus Bengalensis) growing in India and Burma, is considered sacred by the Hindus and little is available commercially. Aerial roots from the branches root into the ground and separate trunks. A Banyan tree has been recorded with a spread of 2,000 feet.

In the words of William L. Stern, B.S., M.S., Ph.D., Assistant Professor of Wood Anatomy, Curator, Samuel James Record Memorial Collection of Woods, and Editor of TROPICAL WOODS, School of Forestry, Yale University:— *"So many facts, including some that are unusual or little known, have never before been assembled in a volume of this kind and skillfully organized for ready reference."*

For our own sakes then, let's spread the word. Let's give this book as a gift whenever the opportunity arises. People who read KNOW YOUR WOODS will give wood products fair consideration whenever they happen to be in the market for furnishings, building materials or recreational implements.

Which reminds me . . . how come the District of Columbia and the states of Iowa and North Carolina have never gotten around to designating an official State Tree and shouldn't something be done about it?

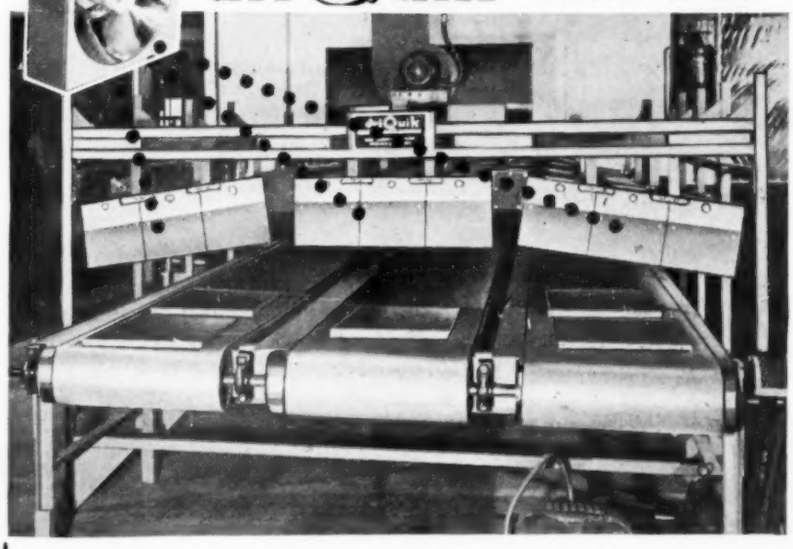
I wish, though, author Constantine would tear out page 95 from his book. For the sake of world peace it would be better that the good citizens of New York, Vermont, West Virginia and Wisconsin never find out that they share the Sugar Maple as their official state tree. *Who Plagiarized Whom?*

Take warning Constantine! Such careless dissemination of truth could easily lead to another Civil War.

As a loyal New Yorker I had better go now and sharpen my axe.

Your Sweet-as-Maple-Sugar,
NELSON NASH

driQuik Infra-red Ovens



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Whitney superior construction builds up greater profits.

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A closeup of the entrance of the Fitler Elementary School's first floor shows the plywood and frame construction of the smoke barriers and the double swinging doors, themselves coated with fire-retardant paint. This three-story-school is one of 67 public schools in Philadelphia in which smoke barriers are installed.

PUBLIC BUILDINGS:

Fire-Retardant Paint Permits Use Of Wood

Are you familiar with an easy method to both fireproof and decorate wood in one easy application? While fireproof paint can be used to protect existing structures, its most important application can be in new wood construction that meets fireproof standards set up in codes covering schools and other public buildings. This, in addition to the natural strength and insulation value of wood, will help our industry gain headway in this most important field.

A Philadelphia school official reports on plywood smoke barriers protected by fire-retardant paint. While this is reported from tests made in school buildings, it is of even greater significance when considering wood construction for many other public buildings. Revised Standards for flamespread indicate that still greater use can be made of wood as a structural, as well as a trim material in public buildings.

Mr. Arnold Jefferies of the Board of Education's building Maintenance Division recently presented a report of the fire protection program of the School District of Philadelphia before the Philadelphia Safety Council. After stating that the installation of smoke barriers was one of the most important fire-prevention measures taken in the program, Mr. Jefferies reported that soon after deciding to use smoke barriers, a comparative test was run under controlled conditions at the Robert Morris School. Smoke barriers were built at one end of the school building from the basement to the third floor, while the opposing stairway on the other end was left open. Starting with the test on the barrier-protected stairway, Mr. Jefferies described the tests themselves as follows:

"The smoke bombs were then ignited. The stairway quickly filled with smoke and was untenable within three minutes. By this time everyone was out of the stairway because of the dense smoke. We were forced back into the corridors, and it was actually 22 minutes before any appreciable amount of smoke seeped into the corridors from the stairway.

"After the building was cleared of all the smoke, we proceeded to the other end, where the stairway did not have these smoke enclosures. Smoke bombs were lighted at the bottom of the stairway, and within 3 or 4 minutes the stairway and corridors were so dense with smoke that they were untenable.

"You can see just how these barriers can and do hold back poisonous gases and smoke. Everyone present at the test was very much impressed and enthused with the outcome. The School Board was then given the 'Go Ahead' signal to install these partitions in the buildings where they are now being erected."

Fire-Retardant Paint For Barriers, Woodwork

In explaining the construction of the smoke barrier, Mr. Jefferies also described the function of fire-retardant paint on both the smoke barrier and other locations in the building:

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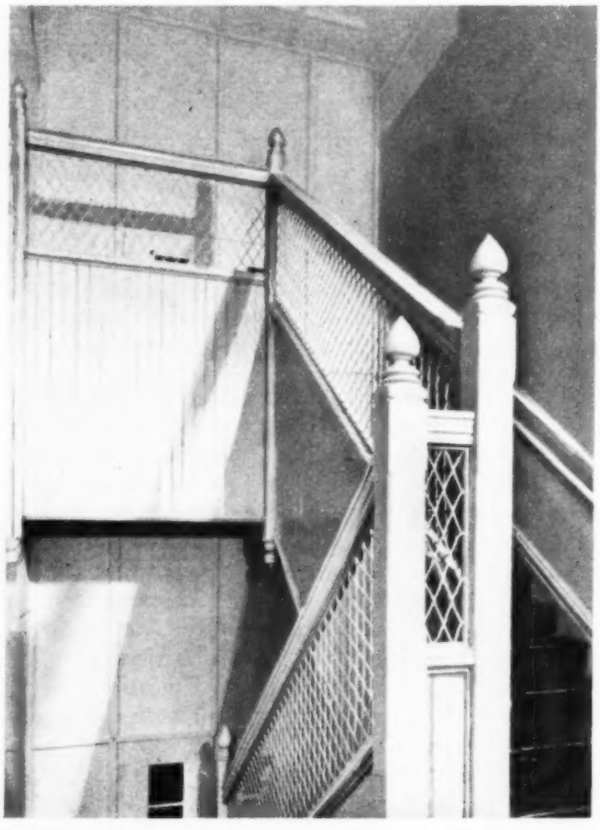
"Plywood is the material used to make these partitions and to make them further flame retardant they are given a coat of fire retardant paint. This paint will hold back flames that might reach the stairway for a sufficient length of time to allow evacuation of the building. The paint we are using is classified as have a flamespread of 15. We are now using this type paint on all new partitions and wood work that we erect in the school buildings. We are also painting the stairways and doors that lead from the basement to the first floor in our non-fire-resistant buildings. We are also using fire-retardant paint on all exposed wood joists in the basements of very old buildings."

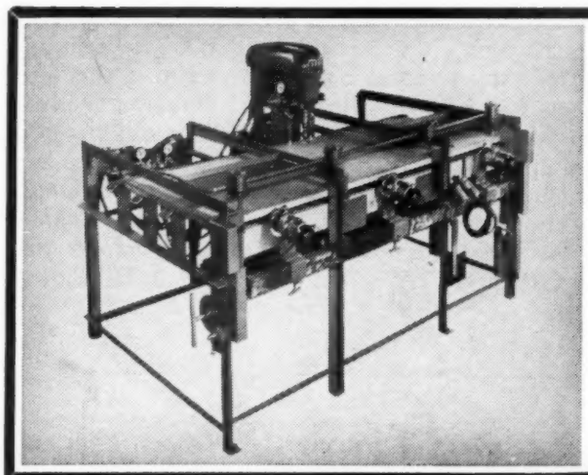
Fire-Retardant Paint Prevents Heat Transmission

Incombustible "fire proof paint" will not burn of itself. It is basically fire-inert but it will not appreciably retard the transmission of heat from the fire into the surface over which it is applied. Effective fire-retardant paint, on the other hand, not only does not support combustion but most important retards the spread of flame, and actively insulates the surface against transmission of heat.

While "fire proof paint" many not increase the fire hazard, modern intumescent paints are actively fire-retardant in that they release CO_2, a well known fire fighting agent, as well as other inert gases which blanket off the oxygen and dilute any combustible gases already in the air. At the same time they form a sponge-like mat which insulates against ignition damage.



A view from the landing between the second and third floors of the Fitler School show the plywood smoke barriers on both levels, indicating the tight smoke construction throughout.



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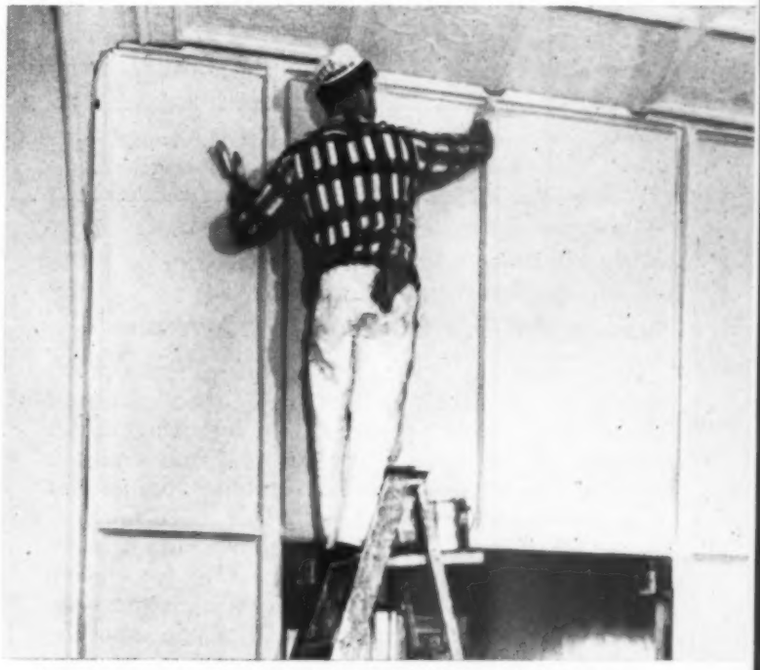
Class A Limit Raised From 20 to 25 Flamespread

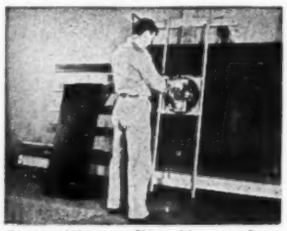
At the N.F.P.A. national convention in Montreal the third week in May, a revised Standard for "Fire-Retardant Treatments of Building Materials" (N.F.P.A. 703-T) was approved. This standard includes two classes—fire-retardant pressure impregnation and fire-retardant coatings. Two major classifications were set up for both methods—Class A having a flame spread rating of 0-25 and Class B a flamespread of 26-75. It is expected that this new standard will prove a forerunner to increased emphasis on Class A construction in critical fire hazard areas, particularly in school and institutional type buildings for corridors and egress passageways. Underwriters' Laboratories listed intumescent fire-retardant paints will permit the use of combustible or "slow burn" building material in such construction under the revised Class A standard. This is based on a flamespread rating of 25 or less in a one coat application.

Rockford, Illinois, Code Model For Others

Speaking of classifying internal interior finishes according to flamespread ratings, the city of Rockford, Illinois, has established unusually clear flamespread specifications in its building code that manage to be precise in a relatively few words. Chapter 49, "In-



Here intumescent fire-retardant paint is being applied over a third-floor plywood smoke barrier. Brushed on like a conventional paint, it serves equally well as a decorative finish. Since both the unfinished plywood and conventional paints are combustible, the use of fire-retardant paint on the smoke barriers permits the use of low-cost building materials by making all wood surfaces, framing and doors fireproof.



Cross-cutting a '4' wide panel on Model 483

CROSS CUTS

Both cross cuts and rip cuts may be made without removing panel from machine. Vertical and horizontal scales for selection cuts. A one man operation!

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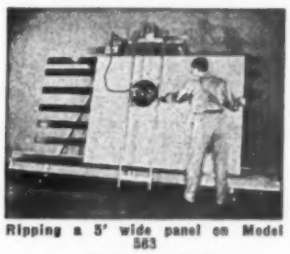

Ripping a 5' wide panel on Model 563

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In Use Coast-to-Coast by

- RETAIL LUMBER YARDS
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- SASH AND DOOR MILLS
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- CRATING AND SHIPPING DEPTS.

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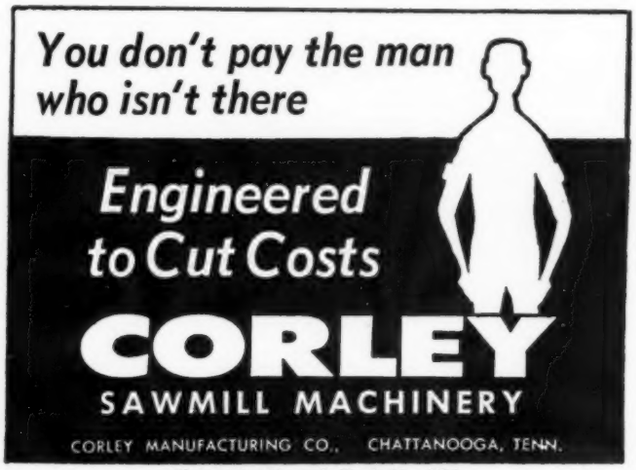
terior Finish Requirements", of this code applies the following classes and flamespread ratings in accordance with ASTM Standard E84 for flamespread tests: Class A (0-25), Class B (26-75) and Class C (76-200). All common types of commercial, institutional and industrial buildings of various sizes and number of stories are classified into "interior finish groups". The following table for three particular interior finish groups demonstrates how Chapter 49 specifies flamespread requirements in the first three classes:

Interior Finish Group	Typical Buildings	Sprinklered	Required Exitways	Room with floor area of not over 500 sq ft	Room with floor area of over 500 sq ft
IF—1	Jails, detention homes	No	A	A	A
		Yes	A	A	A
IF—2	Hospitals, nursing homes	No	A	B	A
		Yes	B	B	B
IF—4	Theatres, auditoriums, schools and churches	No	A	C	B
		Yes	B	C	B

Flamespread Test Extended To 30 Minutes

As a recent step in the increased use of flamespread ratings to represent the fire-safety characteristics of structural materials, a western insurance rating bureau recently tripled the already severe flame exposure time in the Underwriters' Laboratories tunnel test from a standard 10 minute exposure to 30 minutes. It was felt that such an exposure time would be more useful in setting up flame-resistant ratings for wooden roof deck construction. On the basis of initial tests, it was established that under the 30 minute exposure, materials with a "flame-spread not over the equivalent of 25 and showing no evidence of significant progressive combustion" would be considered satisfactory.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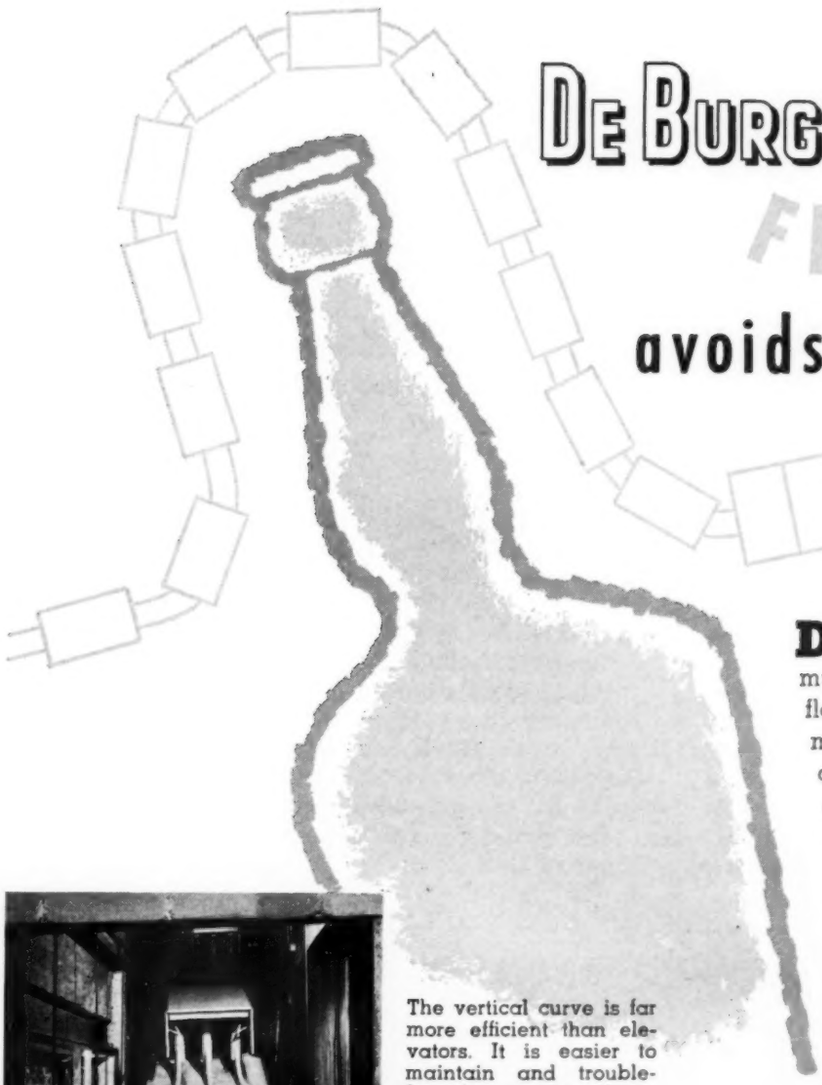
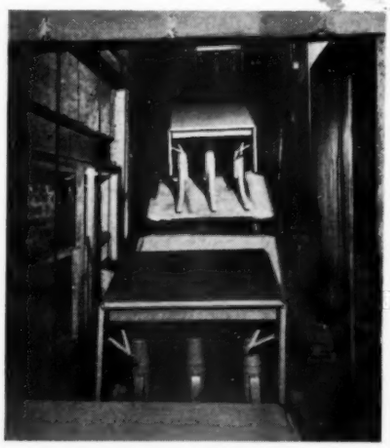
DeBurgh FLEXIBILITY avoids bottlenecks

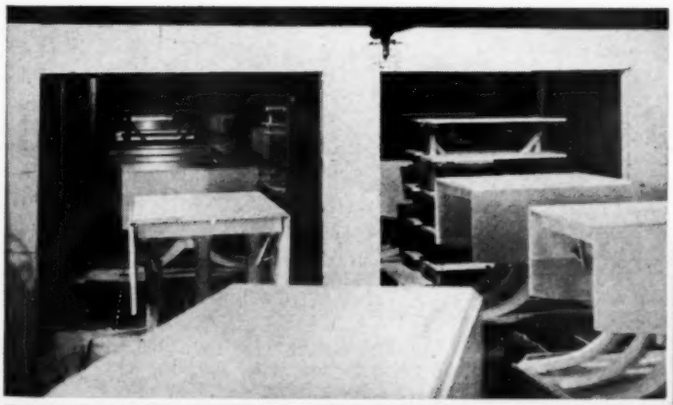


DeBurgh conveyors are easily installed for multi-floor finishing operations or complex floor layouts. Both large and small items may be run on the same conveyor with adequate spacing and time allowed for each. Pieces can be stopped temporarily or halted indefinitely for unusual operations . . . striping, application of decals, leather tooling, antiquing, etc. As production enters the dryer, pallets are "close packed" to save valuable dryer space and time. Products may be assembled, finished, cooled, rubbed, trimmed and packed for shipment without leaving their original pallets.



The vertical curve is far more efficient than elevators. It is easier to maintain and trouble-free for carrying furniture between floors, although where space is a factor, elevators are available. DeBurgh conveyorization moves tables through "close-pack" and "regular pack" . . . handles mounting jigs for table leaves, etc.

COMPLETE CONVEYORIZED FINISHING SYSTEMS



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Bottoms of wall cabinets are levelled on a vertical platen sander with special belt.

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by Gene A. Kemp
The Carborundum Co.

Kitchen cabinets are a competitive piece of merchandise which must be run on a mass production basis. But, the very competitive nature of this industry also demands a high degree of excellence in the finish. Boro Wood Products Company of Bennettsville, S.C., has solved this dilemma with modern coated abrasives since the surface preparation of wood is the key to any good basic finish.

Boro handles a variety of wood materials, including natural and tinted ash, birch and maple, and offers a full range of enameled finishes. These finishes present a variety of sanding and finishing problems.

White goods clean up begins in the machine room where the stock is leveled and all knife marks are removed with Aloxite furnished drum sanders in grits from 60 to 150. Grit sequence is varied with specie of wood and the component location in the cabinet.

Flat surfaces are polished in the sanding room on standard stroke sanders equipped with Aloxite belts in 120 and 150 grits.

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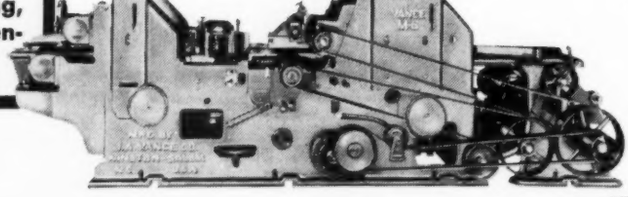

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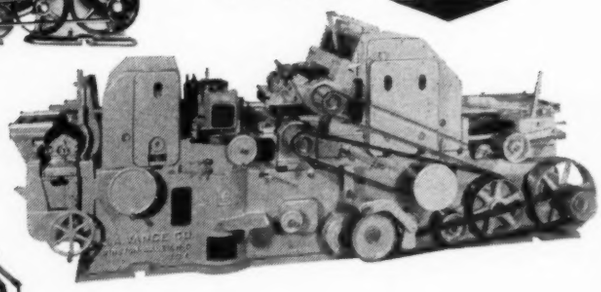

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No. 30 AUTOMATIC FEEDING TABLE
for fast feed and smoother operation.

Also available: 4-roll matchers for lower production mills. Double end trimmers, live rolls, sawmills, edgers, etc. Write today for detailed information.

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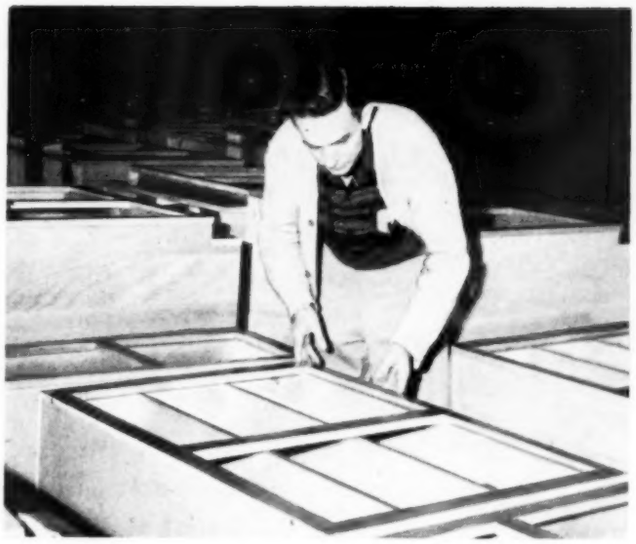

Cabinets move separately from doors and drawers through the final drying oven and come together again in the assembly department.

Modern shapes on door edges present some of the more critical problems. These shapes are sanded with the aid of custom designed contour forms on an edge sanding machine. Open coat flex 45 garnet coated cloth belts in 80 to 100 grits provide the necessary strength and flexibility for this edge sanding.

It is important to level the bottoms of wall cabinets after assembly. This is accomplished on a vertical platen sander with a 60-grit, "X" weight garnet cloth belt, 24-inch wide by 274½-inches long. Belts for this machine are specially spliced by Carborundum to eliminate "bump".

Cabinets are spot sanded in the finishing room with 120-grit cabinet paper. Then, orbital air driven sanders, furnished with 3-2/3" x 9" cut sheet finishing papers in 120 to 240 Sic EC OP, level intermediate coats and remove dust nibs.

This typical Boro cabinet installation includes oven, range, hood and sink. Finishes are offered in a variety of natural wood and bright enamel.

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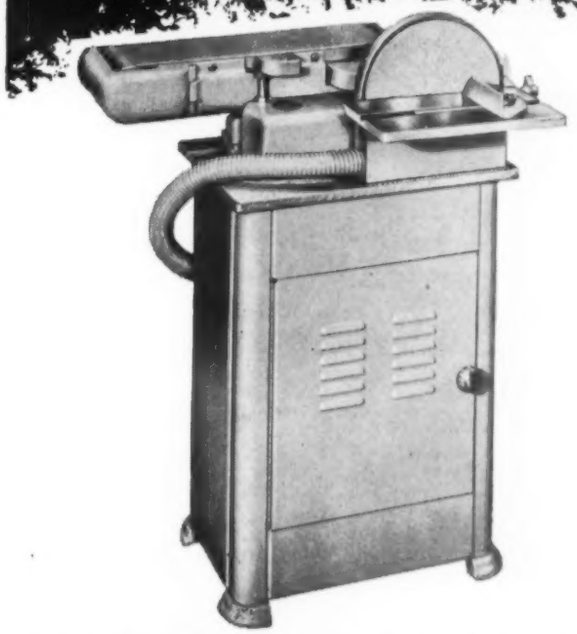

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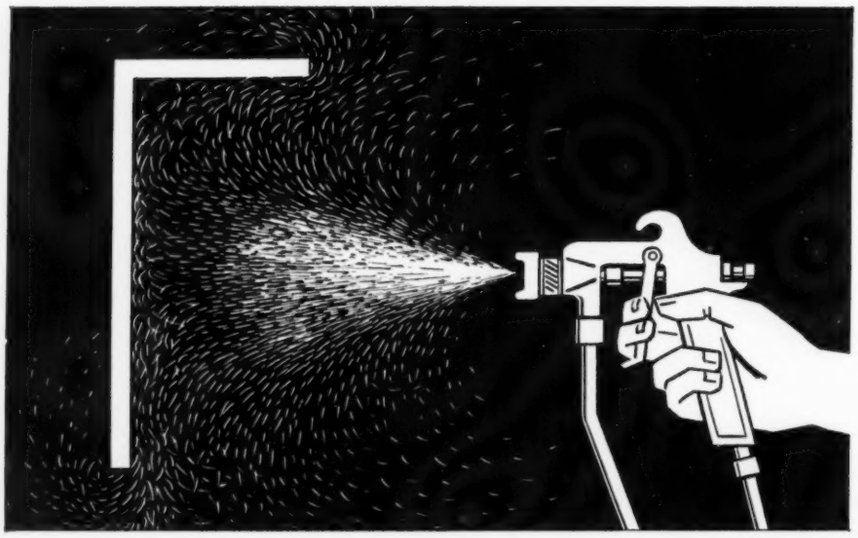

Whenever you see paint fog you see paint waste. Waste that can cost **you** thousands of dollars. Nordson, and only Nordson, overcomes this problem of paint waste with a system that employs **both** heat and pressure — a system that provides maximum control over both cost and quality. With the Nordson Hot Airless System, savings of 30% on coating materials are common. Improved finishes and labor savings, too.

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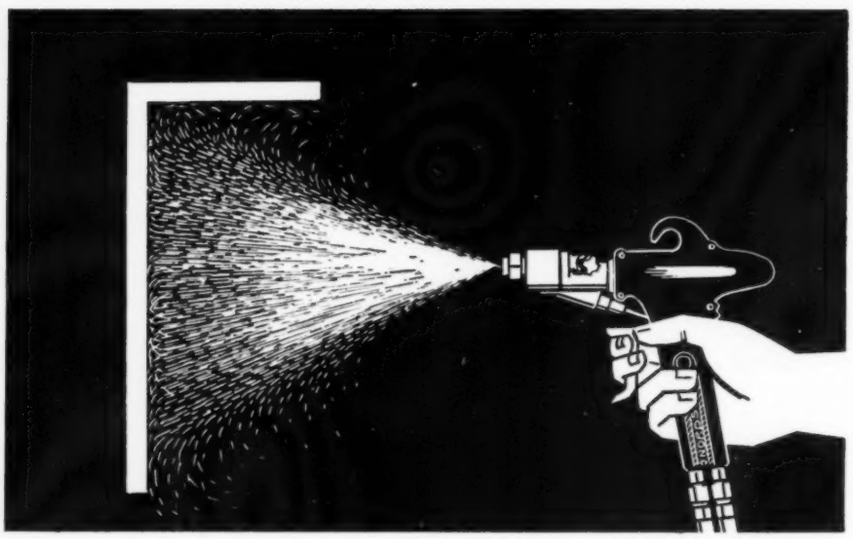

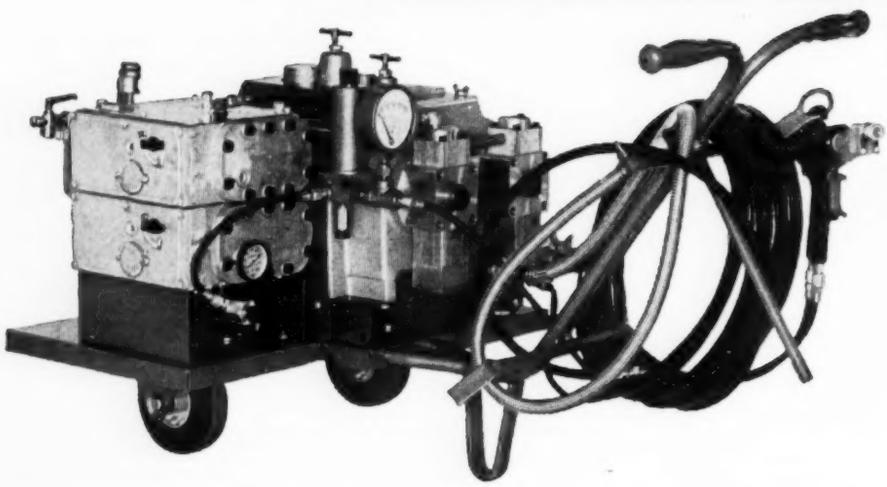

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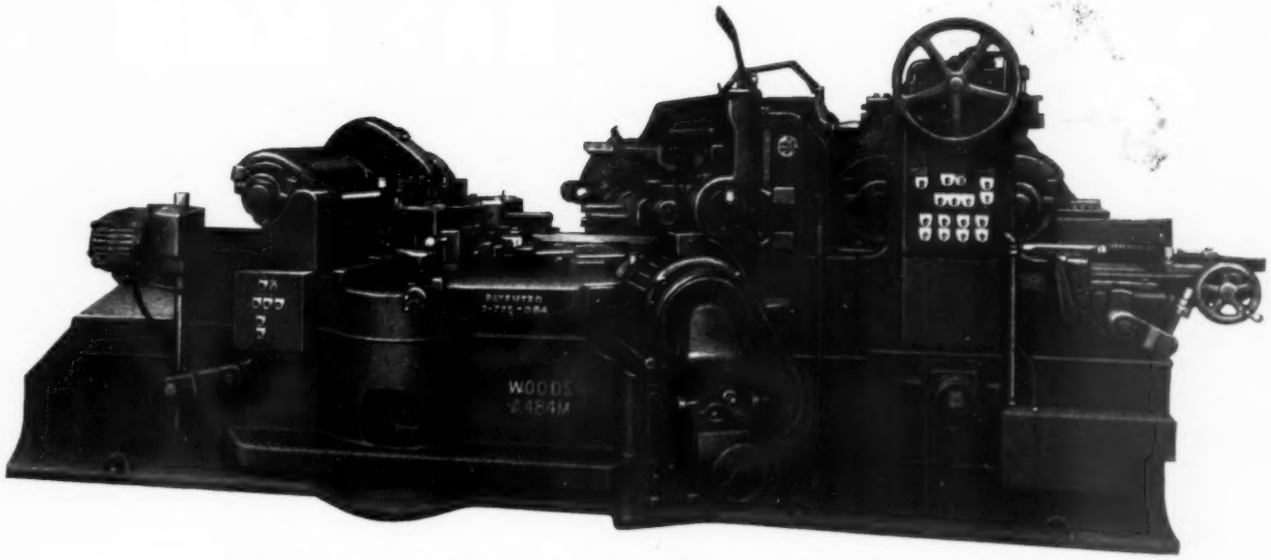

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- ★ Wide face helical gears for feed works, assuring continuous tooth mesh and quieter operation.
- ★ Independent quick green stock lift for first bottom feed-in rolls.
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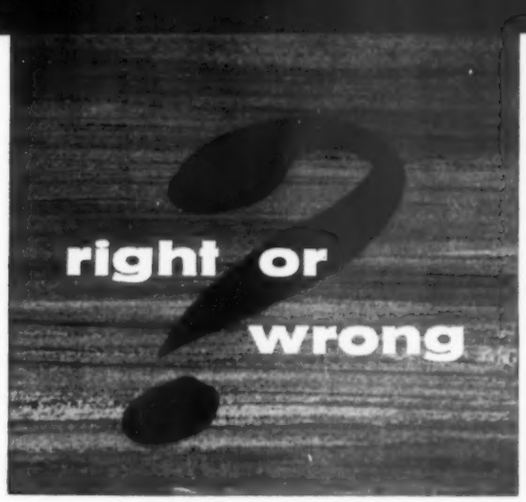
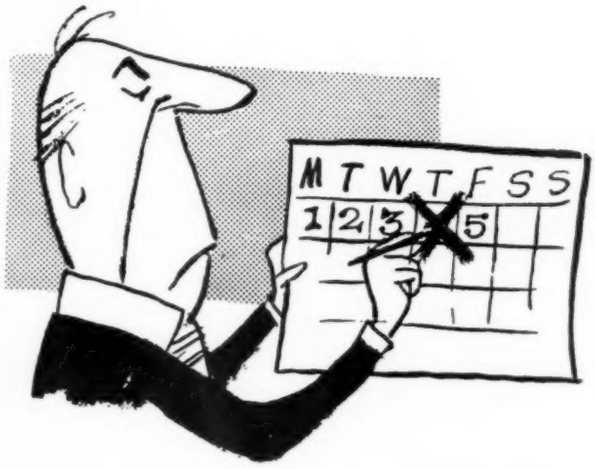
A roundup of day to day in-plant problems and how they were handled by management men. Each incident is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to Hitchcock's WOOD WORKING Digest.





Does management have the right to reduce the work-week?

What Happened:

Because of a strike at one of their supplier's plants, the company didn't have enough materials on hand to keep all the workers occupied. Instead of a layoff, the company decided to go on a 4-day week. This would keep all of the employees on.

"You can't do this," said the union. "We have a clause in the contract which says that the work week should be 40 hours a week. That definitely means that the hours for the week cannot be reduced. If you must reduce on production, then use layoffs so that senior men will still have that 40-hour week."

The company took exception to this. That 40-hour-week clause is not a guarantee. It's just a statement of general policy to indicate when overtime starts. Furthermore, as the management, we are the ones to decide what the work-week is.

Was The Company: RIGHT ☐ WRONG ☐

What Arbitrator Howard G. Gamser ruled:

"The right to relieve or lay off employees from duty because of lack of work or other circumstances is a management right. A clause defining the work-week as being 40 hours cannot be regarded as a guarantee of employment for all or any particular group of employees for any specific number of hours per day or number of days per week. The company has the right to make a decision to operate on a 4-day week."

Can an employee be fired for keeping company tools in his locker?

What Happened:

When a lot of tools began to disappear the company decided to do something about it. A diligent search of the plant premises was started. In the course of this investigation, employee lockers were opened.

In one of the lockers, a real cache was discovered—a bundle of maintenance tools. When he was confronted with this find, the employee claimed that he had no intention of stealing any of these tools. He put them in his locker so he could use them when needed. He charged that the company was lax in controls of tools. They would be lying around and when

he had to use them, some were often missing. So he put them into his locker. None of the tools could be used personally for they were all specially designed. Also, the worker said, management had no rules prohibiting employees from putting tools in the lockers.

He was fired, and the case went to arbitration.

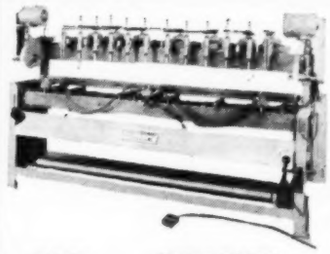
Was The Company: RIGHT ☐ WRONG ☐

What Arbitrator Edwin R. Teple ruled:

"There is no doubt about the right of management to discipline employees for proper cause. This is obviously necessary to the efficient conduct of company operations. There is no doubt that theft of company property is one of the most serious infractions committed by an employee. No rule prohibiting the unauthorized taking of company property is normally necessary. An employer has a right to expect basic honesty in his employees.

"At the same time, arbitrators normally will not sustain disciplinary action based upon alleged theft unless the company is able to prove the charge beyond a reasonable doubt. In this case, however, there remains the admitted fact that the grievant deliberately removed these maintenance tools from the places where they were in use, and placed them in his locker with full knowledge that he was not authorized to do so. Some of these tools were not only valuable, but were frequently needed by other company employees in connection with maintenance work.

"Whether or not the grievant intended to steal this property, it is clear that he effectively removed it from the area where it might have been used when needed. There is not one word of testimony that the grievant notified his foreman or anyone else that he had these tools in his locker and that they would be available whenever needed. To thus hoard company equipment, of considerable value, needed by other employees, must have had the same practical effect, so far as the company was concerned, as a theft. The grievance is therefore denied. The company was justified in discharging this employee."



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Must you let an employee finish his trial period?

What Happened:

The company had the following policy: "If the employee does not make satisfactory progress during the fifteen-day trial period, he shall be laid off."

Bertha Shlusser was tried out for a job. The company had a certain standard for output. Most of the employees who were tried out in the job met the standard. But Bertha was slow. At the end of five days the company was fully convinced that she wouldn't make the grade, and let her out for failure to meet the minimum standards.

The case went to arbitration where the union argued:

1. An employee must be allowed to finish a trial period.
2. The employee was making *some* progress. Management must wait before making its decision.

The company stood on its right to direct the workforce and to make judgments as to an employee's potential.

Was The Company: RIGHT ☐ WRONG ☐

What Arbitrator George S. Bradley ruled:

"The company has the right to establish standards for trainee employees. This practice is justified in the interests of efficient and economical operations. If an employee does not meet qualifying standards ANY TIME during the trial period, the company can take action."

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...around the shop

This monthly feature answers readers' questions on common shop problems. If you wish to present a problem, or desire further discussion of problems discussed here, write to the Editor.

Millwork Preservative Dip

Q. *We have been considering the use of a water repellent preservative for our millwork but question the efficiency of the standard three-minute dip treatment recommended by the National Woodwork Manufacturers Association. Can we get sufficient protective penetration by this method?*

A. The fact that most millwork concerns are now using the standard dip treatment is an indication that results are satisfactory. Research reports in this field show that almost 50% of the total absorption of preservative occurs during the first 15 seconds of immersion. Penetration is necessarily closely related to absorption. Pressure treatment provides optimum penetration; however, the degree of protection generally required for millwork is not as great as for wood used in areas of severe exposure. Furthermore, the cost and time required for pressure treatment would hardly be feasible for the average millwork concern.

Tests made of the three-minute standard dip with water repellent preservatives have resulted in 1″ penetration into end grain and ⅛″ into the face of pine millwork common to the East and 1½″–3″ end grain and 1/16″–1/4″ side grain in yellow pine of the South and ponderosa pine of the West. Sash and frames treated in this manner have successfully withstood the acid test of 8½ years of outside exposure. The results of these tests were probably the deciding factor for inclusion of the three-minute dip treatment in National Woodwork Association Standards.

Danish Oil Finish for Teak

Q. *We have been trying to simulate a Danish oil finish on teak but results to date have not been too satisfactory. Can you tell us what oil is used to obtain the Danish finish and how it is applied?*

A. Our investigation showed a variety of materials being used in Danish plants to produce an oil finish over teak. One of the most common Danish commercial finishing materials is composed of special linseed oil and copal, reduced with mineral thinner. A heavy first coat of oil is applied to saturate the wood surface. Approximately 30 minutes later surplus oil is removed by a light wiping. After drying overnight, another coat of oil is applied and the surface is sanded lightly with 320 or 400 grit finishing paper or rubbed with 4/0 steel wool. This is usually repeated about 4 to 5 hours later, after the surface is dry and clean. The surface may be steel wooled after the final oil application has dried. Reports indicate that 8 to 10 days are required for this finish to harden to optimum resistance but this period will vary with the number of oil coats applied.

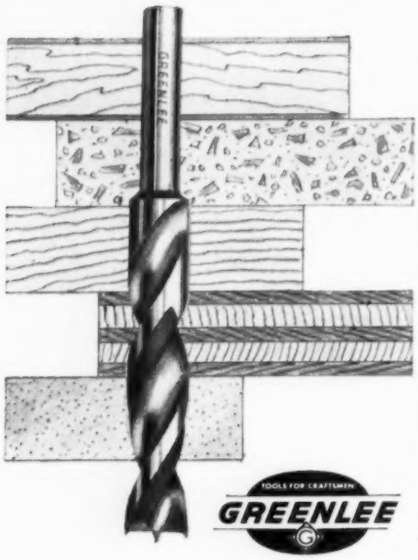
Many finishing material suppliers in the United States have developed very good oil finishes which are faster drying and equal in surface properties to the Danish oil treatment. For best results check with your supplier before undertaking any unusual finish.

Is There a Firecracker Tree?

Q. *A friend of mine, recently returned from a business trip to South American countries, told me a tall story of a firecracker tree which has fruit that explodes at certain times of the year. Was he pulling my leg or is there actually such a tree?*

A. Your friend could have seen such a tree but it was not the fruit he heard explode but rather seed pods. The sand box tree common to some parts of the tropical forests of South America grows a large seed. When mature the seed pod explodes with great violence, scattering fragments and making a sound that resembles the popping of firecrackers.

WHATEVER THE MATERIAL...



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Paper Glue Line Improved

Q. *My partner has just returned from the West Coast where considerable enthusiasm is apparently being shown in the paper glue line. Aside from how it is used, he could tell me little about its formulation and working requirement.—Can you fill me in on these points?*

A. We assume that you have reference to the newer P.G.L. introduced last year by Reichhold Chemicals, Inc. Paper line glues have been used previously, but not quite as extensively as at the present time. This is essentially a waterproof adhesive supplied as a continuous dry film of phenol formaldehyde resin supported on a thin cellulosic carrier that is supplied in roll-form in widths of 38", 50" and 62". It is compatible to a wood moisture content of from 4 to 12%. Other features of this P. G. L. are a storage life of from 6 months at 60°F., the elimination of bleed-through, and better control of adhesive flow. It is also reported to be less expensive to use than previous paper glue line adhesives.

A single sheet of this film glue is used for each glue line. This eliminates the usual practice of passing individual veneers through the glue spreader. Open assembly time is limited and layups with the glue sheets in place can be stored for long periods before pressing under normal temperature and humidity conditions. However, this film glue will pick up moisture at high relative humidities.

Being a dry film glue, P. G. L. adds practically no moisture to the plywood assembly. This in turn minimizes plywood compression during hot pressing. Recommended press temperature range from 290 F. to 315 F.; maximum pressure for dense hardwoods from 250 to 300 p.s.i., for softwoods from 175 to 225 p.s.i. Hot pressing periods average 4½ to 12 minutes depending upon temperature, thickness, number of plies and moisture content. A waterproof bond for hardwood plywood is produced by this film adhesive which meets the requirements of U. S. Commercial Standard CS-35-56.

Glue Line Raising Solved

Q. *We manufacture laminated wood clogs which are finished by lacquer dipping. To facilitate dipping, it is necessary to reduce viscosity of the lacquer with a solvent. We are having trouble with pin holes and ridges raised in the finish at the glue lines of the laminations. Tests show that the glue bond is fully cured before finishing. Can you give us any idea what is causing these defects?*

A. Similar problem investigated at a wood heel plant several years ago was due to the use of a highly volatile solvent in the dipping lacquer. This solvent caused condensation of moisture sufficient to wet the glue line before the lacquer film had set up or become thoroughly dried. The remedy used here was the adding of enough lacquer retarder to reduce the moisture condensation from the adjacent air. A lacquer supplier advises that dispersing from 5 to 10% of sulphonated castor oil might do the trick.

Impregnated Hickory?

Q. *We manufacture hickory picker sticks for cotton mill looms and are toying around with the idea of impregnating them with bearing metal. Some experience in this line has been gained by working with wood preservatives. Can you give us some idea of what would be involved in metal impregnation of second growth hickory?*

A. Almost any species of wood can be treated with suitable metal alloys although the degree of impregnation and metal retention will vary much the same as encountered when impregnating wood with preservative. As compared with preservative treatment, higher temperatures are involved, special heating equipment and handling techniques are employed, and wood units must be relatively small. Treatment pressure as low as 50 p.s.i. is suggested as practical with hickory. This is claimed to produce

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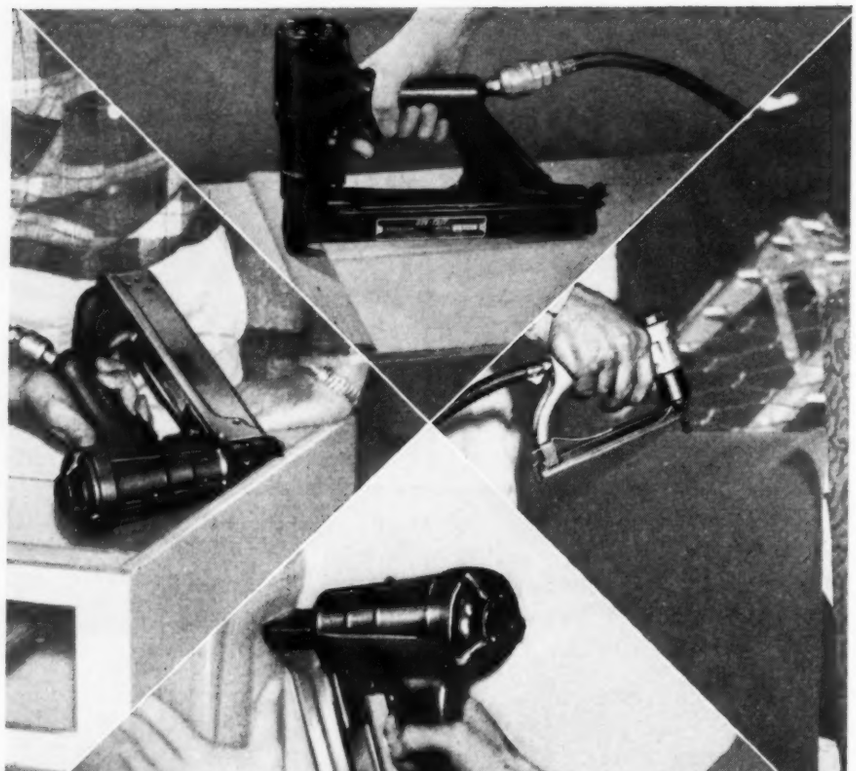

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proper build-up in the wood cells to withstand both heavy and intermittent impact to which your picker sticks would be exposed.

General impregnation procedure involves preheating to just below the charring temperature of the wood and immersion in molten metal until the wood is heated throughout for about 10 minutes. The treating bath is permitted to cool to slightly above the melting temperature of the metal alloy used for impregnation during the time under pressure, usually about 3 minutes.

Our investigation included contacts with textile manufacturers using picker sticks as part of their loom equipment relative to the advantages of metal-impregnated picker sticks. The consensus of opinion indicates that metal-impregnated picker sticks have not performed in a manner to justify their increased cost. Others reported that they have discarded metal-impregnated picker sticks as being impractical.

Alkyd Resin Sealer Finishing Line

Q. *We are interested in automated finishing of hardboard using an alkyd resin sealer. Could you outline procedure and equipment for a typical integrated and automated finishing line?*

A. A hardboard concern using an alkyd resin sealer has panels delivered by lift truck to the finishing line. As the panels are raised by a lift they are fed manually to pick-up rolls for delivery to the carrier conveyor. Carried by a belt the panel passes under a long rotating nylon brush that cleans the upper surface. Panels then move on through a heating oven to be preheated under a bank of infra-red radiant heating lamps.

The heated panels from the oven are fed by powered feed rolls through a roller coating machine which applies the alkyd resin sealer in an accurate controlled-thickness coat. A conveyor then carries the coated panels under a reciprocating buffing head covered with deep pile carpeting to thoroughly work the sealer into the surface. This

sealer coat is cured during travel through another infra-red heating oven at an average temperature of 250°F. Leaving the oven, the panels get another buffing, and after traveling through a cooling oven they are delivered to an automatic stacker.

Diamond Shaped Squares—Why?

Q. *We dry a large volume of squares for furniture turnings produced at our plant. Diamond-shaped squares which develop in the course of drying have been giving us considerable trouble for some time. We have tried adjusting our kiln drying procedure but this defect continues to show up. Air drying seems to produce the same results. What can we do to remedy this condition?*

A. Most squares which diamond in drying are produced by salvage cuts of tops, limbs, slabs, edgings and other cut-off material rather than from selected board stock. If you purchase your squares, this is probably the kind of stock you are getting. The diamond shape is produced by uneven shrinkage, with the greater shrinkage occurring across the rays. Check your defective squares to see if diamond distortion is more pronounced in squares that have rays extending obliquely from corner to corner. Excessive shrinkage in this kind of material can be limited somewhat by cutting the squares to a heavier thickness and in double-width, with proper allowances being made for the saw-kerf. While this involves an extra-ripping operation the reduction in defective material should more than offset the extra cost. If you buy your squares, the safest thing to do is to throw out all squares with oblique corner to corner rays before drying and then change your specifications.

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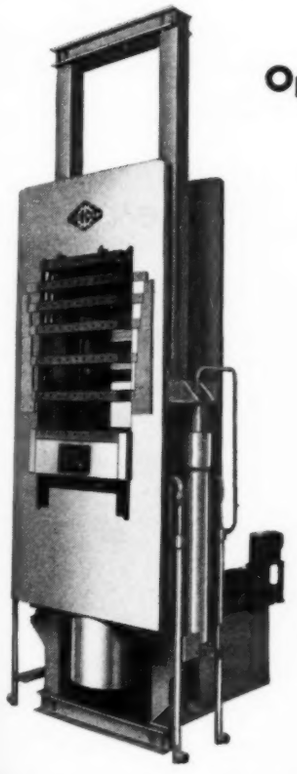

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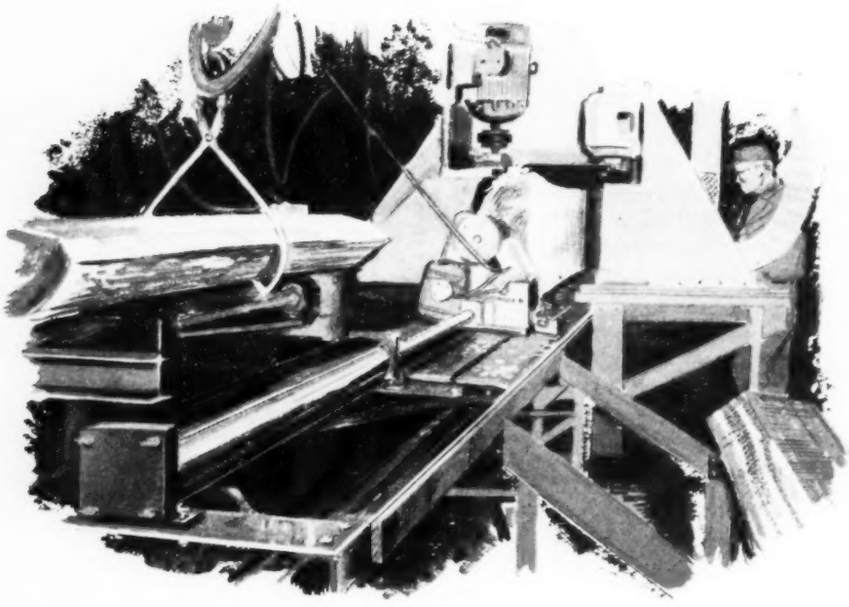

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MACHINERY MANUFACTURERS AND DISTRIBUTORS PLAN JOINT MEETING

The first Annual Convention of the Woodworking Machinery Distributors' Association will be held at the LaSalle Hotel, Chicago, Illinois on Thursday and Friday, September 29th and 30th.

As a special feature of this convention, a joint session has been arranged with members of the Woodworking Machinery Manufacturers' Association who will hold their regular fall meeting concurrently. The Program for this session includes an extensive panel discussion on the subject, "Factors to be Considered in our Mutual Responsibilities to the Customer on Warranties and on Service." Manufacturer and distributor panelists will present their respective views on this vital subject.

"Values of Working Together" Subject of Geddes Talk

This joint session will be conducted by Laurence Field of William H. Field Company, Inc., President of the Woodworking Machinery Distributors' Association, who will introduce Leslie H. Geddes, Greenlee Bros. & Co., President of the Woodworking Machinery Manufacturers' Association. Mr. Geddes will speak on "The Values of Working Together."

"As the Purchasing Agent Sees It" is the title of a talk to be given by John M. Stewart, Purchasing Agent, Greenlee Brothers and Co., Rockford, Illinois.

John F. Spaulding

John M. Stewart

In addition, the joint meeting will hear an address by John F. Spaulding, President of Skil Corporation, Chicago, Illinois, on the subject, 'The Evils and Pitfalls of Price Cutting."

Leslie H. Geddes
President, WMMA

Reception and Dinner

The manufacturers, distributors and their wives will meet together for a reception and dinner, Thursday evening.

Leasing Arrangements

The Program for the three business sessions planned for the First Annual Meeting of WMDA includes a number of very interesting and vital talks on matters of particular interest to Woodworking Machinery Distributors. While many of the speakers will be members of the industry, there are several outside speakers, including Robert Sheridan, president of Nationwide Leasing Company, who will speak on "Leasing Arrangements of Interest to Machinery Distributors".

"What Can be Done About Foreign Competition" is the subject of Vincent C. Hogren, Executive Vice President of Hitchcock Publishing Company. This is a matter of vital importance to all manufacturers and distributors.

Look Ahead—Why and How

At the Final Session on Friday, September 30th, Ernest A. Clevenger, Vice President of Corley Manufacturing Company, will present "Why and How The Successful Machinery Distributor Looks Ahead".

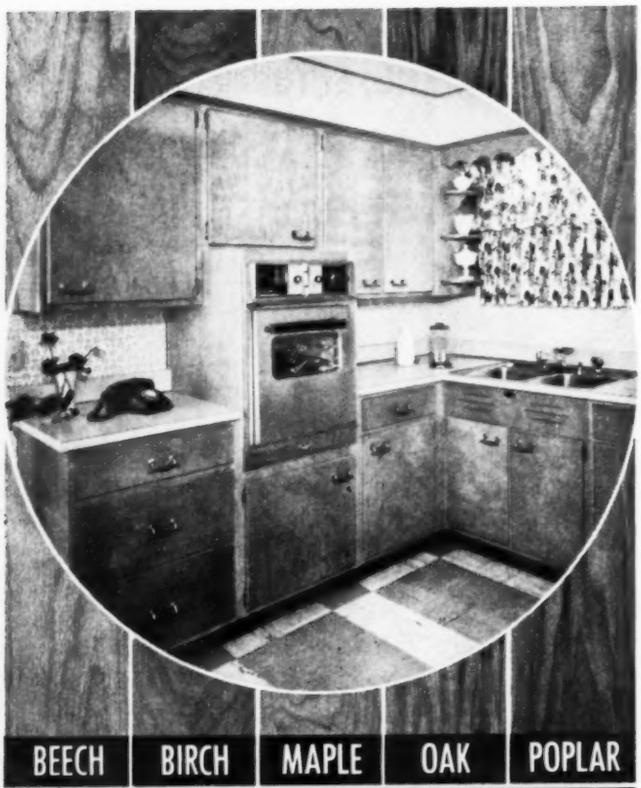
The Woodworking Machinery Distributors' Association, organized September 23rd, 1959, has made strides in building membership and developing a program of activities of benefit to the distributors of woodworking machinery. The association recently issued a report on Overhead Costs for the Year 1958, which gives details, in percentages, of the various expenses of distributor members. A similar report on 1959 operations is now being compiled.

Vincent C. Hogren

Ernest A. Clevenger

Many Reports Available

The association has recently released a detailed Report on Methods of Compensating Salesmen, Their Expenses and Other Pertinent Matters Relating to Salesmen's Agreements. A Monthly Business Index, showing the percentage change in new and used machinery sales monthly compared the major activities of the newly organized WMDA. Now in preparation is a Membership Directory, which also includes the Code of Ethics, developed by the association and adopted by all members.



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PRECISION WB WOOD PARTS

From the Old Smoky Region of the Appalachians

We manufacture our Hardwood Parts for Kitchen Cabinets from *Appalachian-grown* hardwoods — Beech, Birch, Maple, Oak and Poplar — recognized as the world's finest.

All Solid wood parts for Kitchen Cabinets

Williams-Brownell can supply all of the solid wood parts you require—drawer fronts and sides, parting rails, and all other exposed wood parts except plywood doors.

Properly kiln-dried and precision-made

Every foot of lumber we use is scientifically kiln-dried, and *every part* we produce is precision-manufactured to your exact specifications.

Expanded facilities assure prompt service

Larger inventories and increased facilities make it possible for us to give you prompt, dependable service. *Let us quote on your requirements.* Send specifications to W. D. Soderquist, P. O. Box 1091, Asheville, N. C.

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The Danger Of Excessive Rough Planing

What happens in the rough planing of hardwoods —how to avoid torn grain through proper machining practices.

E. M. Davis, Technologist
Forest Products Laboratory
Madison, Wisconsin

The importance of rough-planing in furniture manufacture is often underestimated on the assumption that subsequent machining will remedy any deficiencies. To a large extent this is true. But if the rough-planing job is too bad, the grain may be so deeply torn that the finishing planer cannot dress it out and still leave the desired thickness. Part of the seat of a child's chair shown in Fig. 1, of hard Maple, illustrates the case well. In spite of having been rough-planed, finish-planed, and sanded, the part retains a small amount of torn grain. Torn grain is not peculiar to Maple, but occurs in many hardwoods and often originates with a poor job of rough-planing.

Even where the degree of torn grain is slight, as in Fig. 1, the damage is more than superficial because of the splits that are usually associated with it. High-speed motion pictures have shown that the wood typically splits ahead of the knife edge as the knife approaches the end of the cut. When wood is cut with grain, no damage follows. When it is cut against the grain, the usual result is chipped or torn grain that extends below the line of cut. This is accompanied by splits or grain separations that extend even deeper.

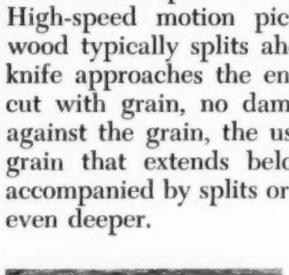

Fig. 1. Part of the seat of a child's chair of hard Maple showing torn grain that remained after planing and sanding.

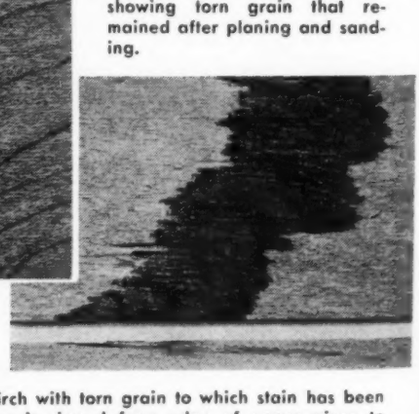

Fig. 2. Sample of Birch with torn grain to which stain has been applied. Lower piece is ripped from edge of upper piece to show length and depth of associated split.

The wood shown in Fig. 2 is Birch. The torn grain area has been treated with a stain that not only colors the surface, but also follows any splits that accompany the torn grain. The lower piece was ripped from the edge of the upper piece and turned to show the length

and depth of the split along the edge.

After 1/32 inch was planed off from the same piece with a jointer, the surface appeared as in Fig. 3. The torn grain showing in Fig. 2 was shallow enough to plane out. A definite grain separation remained, as proved by the stain that was drawn down into the splits by capillary action. This piece was obviously unsuitable for first-class finish. Samples showing about this degree of damage are often sent to the Forest Products Laboratory with questions concerning the cause and cure.

Note the appearance of the same Birch sample after another 1/32 inch of wood was planed off Fig. 4. Although most of the stain had disappeared, traces remained. The 1/16 inch of wood that had been removed in the two cuts had not been enough to reach the bottom of the splits, yet was far too much to be removed by ordinary sanding.

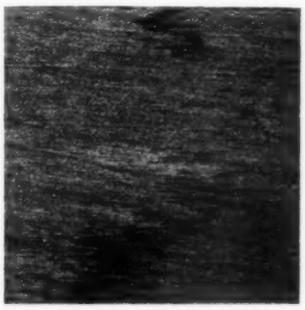

Fig. 3. Same sample as in Figure 2 after 1/32 inch of wood has been planed from surface.

Fig. 4. Same sample as in Figure 2 after 2/32 inch of wood has been planed from surface.

A few minute traces of stain remained after a third cut of 1/32 inch was made and a fourth cut was necessary to remove all evidence of stain. So, even though the torn grain disappeared after 1/32 inch of wood was removed, removal of an additional 3/32 inch was required to completely eliminate the splits that were associated with it.

Because of their grain and texture, Birch and Maple are among the woods that are most susceptible to chipped and torn grain. Assuming that the machine is in good condition and that the knives are reasonably sharp, there are still several steps that can be taken to minimize this sort of trouble.

1. Adjust feed rate or cutterhead speed, or both, to get 16 to 20 knife cuts per inch. Tests made at the Forest Products Laboratory show that hard Maple yields twice as many defect-free pieces with 20 knife cuts per inch as with 10.

2. Avoid unduly heavy cuts as far as is practical, or take a light finishing cut on the face of the material.

3. A cutting angle of 15° to 20° is better than higher angles as far as chipped grain is concerned, and light jointing of knives, not over 1/32 inch wide, is preferable.

4. If the job permits, "graining" the lumber—that is, feeding so that the knives cut with the grain—will help avoid chipping the grain.

✔ ALL CARBIDE TIPPED KNIVES & SPURS

✔ INFINITE ADJUSTMENT FOR DADO WIDTHS, WITHOUT SPACERS OR DISMANTLING

Plus

- Only one nut adjustment for variable widths.
- Alternate *spiral* knives for shearing cut, without tearing grain.
- Diametrical adjustable spurs for perfect scoring.

ALL MARCOLOY CARBIDE TOOLS CUT COSTS

"TRU-HELIX" SPIRAL CARBIDE HEAD With Removable Knives, Free Cutting, No Tear-outs.

"HELI-BIT" MULTIPLE CARBIDE CUTTING EDGES Set on Spiral, Ideal For Surfacing Or Machining Cross & End Grains. Bits Replaceable Economically.

"UNIVERSAL" Cope Carbide Pattern Knives With Combination Grooving Or Rabbeting. Not Possible With Standard Cope Discs.

"UNIVERSAL" (ALL PURPOSE) Cutterheads With Carbide Pattern Knives Up To 1½" Depth Of Cut. Again, Straight Or Pattern Carbide Knives May Be Used In This Head.

INVESTIGATE THE MARCOLOY CARBIDE SYSTEM

A complete survey of your machining problems. A proposed tooling program engineered and designed specifically to obtain lower production costs with Marcoloy Carbide Grades processed in our plant exclusively for wood machining.

MARCOLOY CARBIDES

MARCOLOY, INC.
SPRINGDALE, CONN.

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Available Literature

Power Strapping Tool Booklet

This illustrated 16-page booklet shows how powered tools can be used to increase packaging speed, reduce operator fatigue and produce more secure packages for dozens of users.

Specifications for the applications of all powered stretchers as well as powered and manual sealers are included. The booklet discusses power strap feed assemblies and accessory items such as tool mounts.

The Powered Strapping Tool Booklet, AD300, is available from Acme Steel Company, 135th St. & Perry Ave., Chicago 27, Ill.

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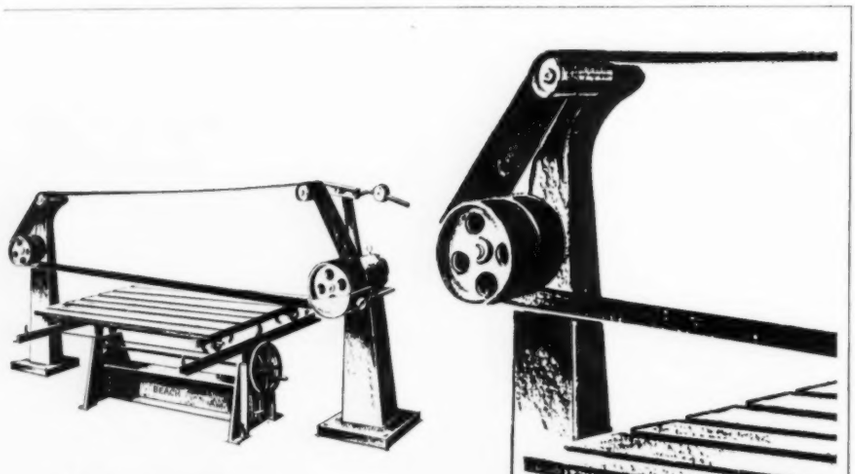

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THIS HAND BLOCK BELT SANDER SANDS AND FINISHES THEM ALL!!!

More than 1000 industrial firms are now using this versatile belt sander, find it exceptionally efficient and economical to operate. You'll find this machine the best investment you've ever made in sanding and finishing equipment. You'll like its low cost, too!!

Sturdily built, this BELT SANDER features a 42" x 80" table mounted on anti-friction rollers; is powered by a standard 2 HP, 2 or 3 phase ball bearing motor. Single phase and special motors can be furnished.

Write today for details on the BEACH BELT SANDER and information on the complete line of BEACH WOODWORKING MACHINERY.

...If you're in a hurry, call us...NOW!

BEACH MANUFACTURING COMPANY
MONTROSE, PENNSYLVANIA

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Easel-Back Card Displays Changeable Samples

A new easel-back display card for Pionite Lifetime Laminates is a sturdy and attractive display which lends itself to many uses.

Fifteen Pionite sample chips can be attached to the colorful orange-and-white card with paper fasteners; are easily changed or rearranged.

Further information on this latest addition to Pionite can be obtained by writing to the Advertising Department, Pioneer Plastics Corp., Sanford, Maine.

Use postpaid card. Circle No. 2

Philippine Mahogany

A new 12-page brochure illustrates in color the complete line of Philippine Mahogany offered by the Insular Lumber Co., 1405 Locust St., Philadelphia 2, Pa.

The booklet includes bedrails, boards, door jambs, flooring, moldings, paneling, shelving, siding and standard grades of lumber.

The moldings show actual size silhouettes of casing, base, base shoe, corner, stop, cove, quarter round, half round, full round, window stool, screen and batten, mull casing, capping, tack, bar, staff, cornice, M-edge insert, chair rail, glass bead, fluted panel, fluted cover and lip mold.

All of the lumber is graded after kiln drying. The paneling, molding, door jambs and S4S quality boards, shelving and bedrails are all shipped wrapped in waterproof paper and steel strapped for maximum protection.

Use postpaid card. Circle No. 3

New Bulletin on "Stock" Cylinders

The front page of the bulletin lists 12 important benefits and the back page gives prices and dimensions on "stock" clevises, clevis and eye brackets, eyes, and pins—and describes desirable stock cylinder variations, such as rotated ports, rotated cushion adjustments, rod extensions, mixed mountings, and piston ring and/or Teflon piston cup seals, all of which are available as part of the stock program.

The center spread of this 4-page bulletin gives the strokes, prices, and dimensional data on the expanded "stock" selection which now embraces Miller Air Cylinders in 1½" through 14" bores; Miller Model "J" Job Rated Hydraulic Cylinders for 500-2500 p.s.i. service in 1½" through 14" bores; and Miller Model "H" Power Packed Hydraulic Cylinders in 1½" through 8" bores for 3000-5000 p.s.i. service.

For further information contact Miller Fluid Power Division of Flick-Reedy Corp., Bensenville, Ill.

Use postpaid card. Circle No. 4

Tenth Edition of Simplified Practice Recommendation

The revision was requested by the National Paint, Varnish and Lacquer Association, Inc., and became effective

in May after being endorsed by producers, distributors, users and other interests. It changes the method of packaging putty, glazing and calking compound products from a weight basis to a volumetric basis. This method of packaging these items will reduce the variety of containers needed, thereby attaining greater simplification and standardization with resulting benefits to all concerned.

Printed copies of the tenth edition of Simplified Practice Recommendations for paints, varnishes and related products, R144-60 may be purchased for 10¢ from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Commercial Standard For Douglas Fir Plywood Revised

This revised edition covers grades of interior type, exterior type, and overlaid plywood. It includes requirements, tests, standard sizes and tolerances, reinspection rules, grade-trademarking provisions, and nomenclature and definitions. The previously approved Amendments to CS45-55 have been incorporated into this revised draft. Material not previously covered in the Commercial Standard for plywood includes requirements and tests for scarfed joints and allowable use of Western Larch. In addition, facsimiles of grade-trademarks and certificates of three qualified inspection and testing agencies are given.

Printed copies of this edition TS-5491 may be obtained from Commodity Standards Div., U. S. Department of Commerce, Washington 25, D.C.

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Belt Sanding Attachments for Portable Tools

Jonvir presents their new belt sanding attachments for portable tools in a 6-page brochure.

It explains how the exclusive Jonvir Belt Tension mechanism automatically controls the belt over contours, keeping it taut for best cutting. This same ingenious device permits belt replacement at a touch.

Curves, contours and complicated radii, so essential in today's product designs, present surfaces difficult and expensive to finish—particularly when hand finishing is employed.

Further information is available from the Jonvir Mfg., Co., 25120 Ryan Rd., Warren, Mich.

Use postpaid card. Circle No. 6

Double Sanding Disc Machines

This 2-page bulletin describes a new concept in double disc sanding machines manufactured in 3 disc sizes 24", 32" and 40".

It describes how the sandpaper can be pushed into a groove of the disc during the standstill of the machine. During the rotation of the machine the centrifugal force stretches the paper on the disc.

For further information write to N. V. Machinefabriek, Helma-Nohoma, Wormerveer, Holland.

Use postpaid card. Circle No. 7

Delta's Tilting Arbor Circular Saw

Delta's 14" variety saw is described in a 6-page, 2-color bulletin. The bulletin includes specifications, catalog listings and accessories.

Designed primarily for wood and plastic manufacturers, lumberyards, builders, contractors and mills, the new saw is also excellent for vocational training schools. It offers heavy-duty capacity 5" depth of cut, massive ruggedness, positive accuracy and extra safety.

For a copy of the Bulletin AD-1201, write Rockwell Manufacturing Co., Delta Power Tool Div., 472 N. Lexington Ave., Pittsburgh 8, Pa.

Use postpaid card. Circle No. 8

Plywood and Board Presses

A catalog of facts and specifications about Becker and van Huellen hydraulic plywood and veneer presses is now available. Other presses for chipboard and fibreboard are also explained.

The 24-daylight oil-hydraulic presses are equipped with a new type of oil pump system. These presses are designed on the unit-construction principle.

For further information write to Karlton Machinery Corp., 210 E. Ohio St., Chicago 11, Ill.

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AMERICAN WOOD HOG

CONVERTS OAK SCRAP INTO FUEL FOR COOPERAGE PLANT

Hard oak, used in the manufacture of barrels, has kept this cooperage company supplied with plenty of fuel (and the steam so essential to its operations). Pieces of 1 3/16" stock, varying from 4" x 15" to 48" x 1" are fed to the American Hog. The company used no coal whatsoever last year—very little in previous years since the installation.

Investigate American's fuel-saving features for your plant's operation.

WRITE for Literature "Making Wood Waste Pay"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1510 Macklind Ave. St. Louis, Missouri

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DuPont's "Tipersul"

The trademark "Tipersul" has been adopted by the DuPont Company for fibrous potassium titanate, a new crystalline fiber material for high temperature applications.

"Tipersul" was developed by the company's Pigments Department from fundamental research on new forms of inorganic materials by the company's Central Research Department.

The small, white crystalline fibers are available in lumps and loose fibers, as well as blocks, sheets and paper forms made by standard felting techniques. Curved or odd shapes are also available.

This material, useful to 2200°F., offers low heat conductivity, great ability to scatter infra-red radiation, and low density. These and other properties make "Tipersul" useful for thermal, acoustical, and electrical insulation, as well as for filtration applications. Another significant use for the material is in ablative insulation. Such insulation absorbs heat penetration, thus protecting space hardware from high temperatures for brief periods. "Tipersul" may be added as filler to "Teflon" fluorocarbon resins to increase dimensional stability of finished products.

For more information write Product Information Service, E. I. DuPont De Nemours & Co., Wilmington, Delaware.

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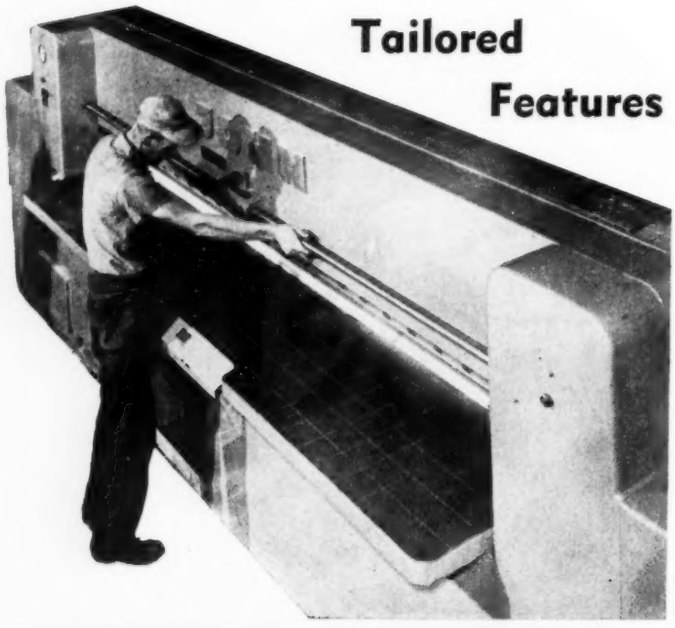
Veneer Jointing
with
Tailored
Features



JOHN GUILLOTINE
Package Veneer Jointer

- Guide line light showing point of knife cut
- Double cut feature for roughing and finishing
- Fully adjustable hold down pressure
- Extra rigid full length parallel back fence, motorized and with large hand wheel for fine adjustment
- Super frame strength for precision glue jointing
- Ten inch wide pressure beam

For full information, phone, wire or write

wilco machine works, inc.

Phone WH 8-4555 **P.O. Box 3897HWD-4**
Memphis 14, Tenn.

Use postpaid card. Circle No. 258

Electric Melting Pots

A new 8-page catalog on electric melting pots for solder, lead, glues and compounds is available from the Vulcan Electric Company, Danvers, Mass.

Catalog VG-201-P contains detailed specifications and prices on Vulcan's complete line.

Use postpaid card. Circle No. 11

Pocket-Size Redwood Siding Estimator

The siding estimator, covering four standard redwood patterns, was prepared by the California Redwood Association.

The slide-rule estimator shows the amount of siding, in various nominal widths, needed for each square of wall coverage. Siding quantity is expressed in both lineal and surface measure. The estimator also computes the quantity of nails needed per square of wall covering, and enables an accurate estimate of costs based on local prices.

Sample Redwood Siding estimators may be obtained from the Dealers Service Library, California Redwood Assn., 576 Sacramento St., San Francisco 11, Calif.

Use postpaid card. Circle No. 12

Transportation of Wood-Chips

Baughman's 2-page brochure describes their Model WC-8 wood-chip transport body. The brochure tells about the self-loading conveyors which cover the bottom of the transport body and are driven by a common shaft at the rear of the body.

They are designed for transporting bulky or lightweight material. The bodies are available in three different drives on the self-unloader.

For further information write for Form A-447, Baughman Mfg., Co., Jerseyville, Ill.

Use postpaid card. Circle No. 13

New National Starch Bulletin

Bulletin 340 contains technical data on National Starch and Chemical Corporation's new polyvinylidene chloride latex, Resyn 3600.

It describes the physical and chemical properties of Resyn 3600, both in latex and film forms. It also specifies degrees of resistance to water vapor and common gases at varying film thicknesses (along with comparative data on polyethylene films); formulating information; and chemical resistance data.

Resyn 3600 is an aqueous dispersion of vinylidene chloride copolmer. Because of its combination of barrier and application properties, the new product should find wide usage as a protective coating for packaging materials.

The bulletin is available from the company's Resin Div., 750 Third Ave., New York 17, N.Y.

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Woodworking Trade Show To Be Held In New York, October 6-8

If you are interested in learning all about the latest woodworking machinery, equipment, tools, and accessories plus their correct application be sure to mark October 6-8 on your calendar. This important woodworking trade show sponsored by Rudolf Bass, will be held at the Sunnyside Garden Arena, Queens Blvd., and 45th Street, Long Island City, New York.

Industry Invited To Bring Production Problems

This show, the only one of its kind in the metropolitan New York area, will feature lectures by top notch men in the woodworking industry. Motion pictures covering actual plant application of machinery and equipment will be shown. Factory experts will be there to demonstrate equipment and go over possible application to meet your production needs.

You can come right to the show from work—the doors will be open from 2 to 10 P.M. A free buffet supper will be served every night as a convenience for those attending.

All Types of Woodworking Equipment To Be Shown

Exhibits of at least 50 manufacturers will be on display. Production woodworking machinery shown and demonstrated will include all types of saws, borers, sanders, planers, etc. Accessories and equipment shown include dust collectors, chucks, arbors, drilling and tapping attachments, finishing material, benches, clamps, and safety guards. Supplies such as abrasives, boring tools, and glues will be discussed by the experts.

Be sure you have a ticket as admission will be by ticket only. The show will not be open to the public. For your ticket and additional information write or call Rudolf Bass, 173 Lafayette St., New York 13, New York.

Melco
CUSTOM CARBIDE CUTTERS
Router Bits ■ Saws ■ Knives
Shaper Cutters

Dealers Invited — Send for free catalog
MECHANICS. INC.
55-11 Queens Blvd., Woodside 77, N. Y.
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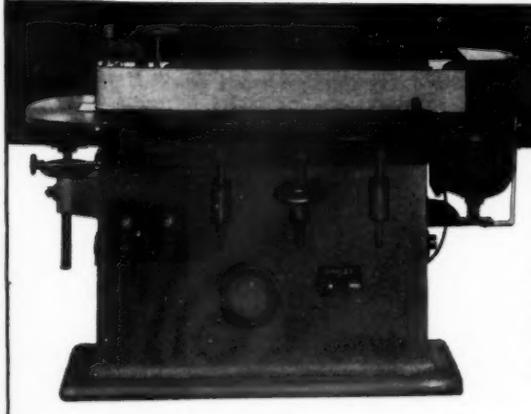
SAVE BIG DOLLARS...IN SMALL SPACE!



OAKLEY H-6 EDGE SANDERS

So . . . you're working limited size stock . . . and you don't think you need to buy a heavy-duty sander. You're right! Because the Oakley H-6 Edge Sander is a light-duty unit requiring minimum floor space combining heavy-duty performance and keen precision.

- BALL-BEARING OSCILLATION
- TABLES TILT QUICKLY
- PRECISION BUILT

Write For Free Information Today
Department 10

OSCILLATING OR NON-OSCILLATING
Model H-6 is the oscillating sander with Models H-6A the non-oscillating unit. Both are very reasonably priced.

The Oakley Co.
SINCE 1934
BRISTOL TENNESSEE

Use postpaid card. Circle No. 259

Longer Life for Band Saw Blades!

Wright
BAND SAW GUIDE

For all types of commercial band saws . . . standard equipment on many. The Wright Guide protects and extends saw life, is virtually frictionless. Replaceable hardened steel jaws, dustless, easy to lubricate. Available in 4 sizes.

BALL BEARING GUIDE WHEEL
Vastly reduces friction at points of contact, eliminates wear and tear and resulting saw breakage. 3 sizes, for Wright and other guides.

Write for Free Folder
BLACK DIAMOND
SAW & MACHINE WORKS
80 NORTH AVE.
NATICK, MASS.

Use postpaid card. Circle No. 261

News Notes In Brief

DFPA Field Force Expanded

Stanley A. Taylor, field promotion director for the Douglas Fir Plywood Association, explains a point to nine new members of his 81-man staff during a session of special three-week training period. The nine, all engineers or specialists in construction, will be calling on architects, builders and other major construction and industrial specifiers to help with information about plywood and its application. The new group, from left, and the cities where they will be assigned: Kenneth L. Henson, Paterson, N.J.; Marvin Boutwell, Jacksonville, Fla.; Fearn LaBan, New Orleans, La.; Donald D. Hill, Birmingham, Ala.; N. Vincient (cq) Clinevell, Greensboro, N.C.; Jack L. Carpenter, Cincinnati, O.; Mujib S. Metti, Albany, N.Y.; Jack V. Walker, Detroit, Mich., and William M. Menger, Manhattan, N.Y.

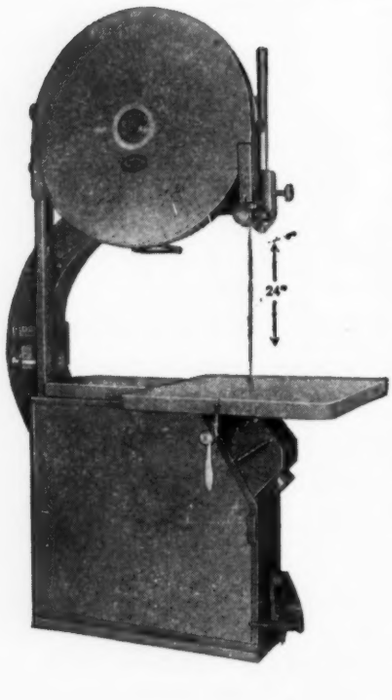
Abitibi Opens Chicago Office

To provide better service for Midwestern Industrial Firms, Abitibi Corporation of Detroit, Michigan has opened a new District Sales Office at 333 North Michigan Avenue, Chicago, Illinois.

The office will serve companies in Illinois, Indiana, Kentucky, Missouri and Wisconsin.

Abitibi manufactures a complete line of wood-grain finished Plate-Board, smooth two-sides and smooth one-side hardboard and a broad line of insulation board, all of which are available in mixed carload shipments from their mill at Alpena, Michigan.

if it has all these features it's a MOAK SUPER BAND SAW



24" HEIGHT UNDER GUIDE. Due to the heavy construction of this machine it has been possible to provide a 24" height between the table and the upper guide. This extra capacity does not in any way affect the vibration of the machine, which is kept at an absolute minimum.

2 EXHAUSTS. The exhaust immediately under the table encloses the lower guide and pulls the cuttings and dust away as it is removed from the stock. The other exhaust is cast in the frame of the machine and pulls the dust from the lower left hand side of the guard.

LUBRICATED FOR LIFE. Both motor and wheel bearings are lubricated for life and sealed against dust and dirt. Gone forever is the need for periodic lubrication. Eliminated also is the risk of costly over-greasing and under-greasing.

OPERATOR DOES EVERYTHING FROM ONE POSITION. The Moak High Speed Band Saw is the only band saw on which a man can perform every operation without moving from his tracks. The resulting saving of time and energy means increased production.

MECHANICAL EQUALIZED TWO WHEEL BRAKES. When the foot pedal is depressed the motor is shut off and both brakes act simultaneously. If a saw blade breaks or runs off the wheel, current shuts off and both brakes apply automatically.

TRACKING GAUGE SAVES TIME. Visible through a small window in the upper wheel guard is a pointer which indicates whether the saw blade is centered or not. If not it can be properly adjusted. This Moak feature saves time and also fully protects the operator while he is tracking the saw.

You don't buy a band saw every day. When you do, buy the best. For complete information on Moak 36" Super and 26" High Speed Band Saws, write for our illustrated booklets.

Use postpaid card. Circle No. 262

Roddis Transfers Assets To Weyerhaeuser

Shareholders of Roddis Plywood Corporation voted at Marshfield, Wis., July 28, to transfer assets of the 70-year-old firm to Weyerhaeuser Company. Approval of the acquisition came in a special meeting at Roddis headquarters. The transaction is expected to be completed early next week.

Roddis is a producer of plywood, lumber, veneers, glues, flakeboard, doors and hardwood specialties. Manufacturing facilities, timber and cutting rights are located in Vermont, Wisconsin, California, Canada and Costa Rica.

Weyerhaeuser Company is a diversified producer of Western softwood lumber and plywood, as well as pulp, paperboard and converted products.

The announcement said that the acquisition would provide a more complete product line and complementary distribution facilities. Roddis operates warehouses in 34 states and Canada.

Reiss Manufacturing Corp. Takes New Name

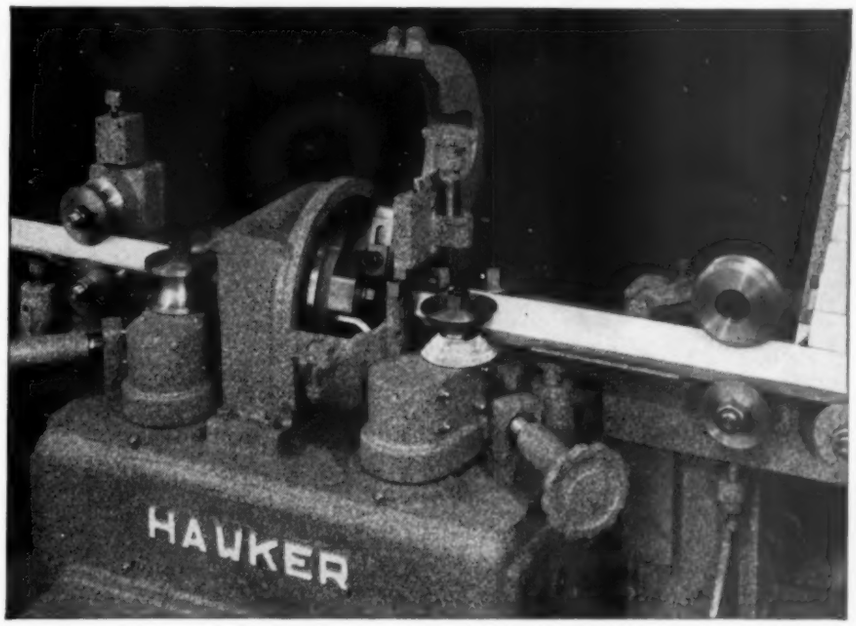
Raymond H. Reiss

Raymond H. Reiss, president, has announced that the Reiss Manufacturing Corp. of New York will be known as the Ronthor Reiss Corp.

Well known for the engineering and manufacture of supplies for the furniture and cabinet industries, the Reiss Mfg. Corp. is also active in the missile and nuclear field through other divisions. Rapid growth and wide-spread acceptance of new Reiss products, particularly in the cabinet and furniture field, necessitated a distinctive registered name.

Key personnel and policy throughout the corporation will remain unchanged outside of a marked increase in sales representation in the Industrial Products Division.

All products for the furniture and cabinet industries formerly distributed through R-WAY Industrial Products Division will now be known as RONTHOR PRODUCTS and will be distributed through Industrial Products Division. Write Robert De Young, Division Manager, Box 718, Sheboygan, Wis.



exact control

in blanking and finishing rough squares

Blank out rounds at high feed speeds and get best surface finish on any wood with Hawker's control of cutter speeds and feeds. No chatter, spinning or twisting. Self-centering infeed guide plus horizontal and vertical outfeed rolls hold stock firmly during cutting! Easy adjustment gives minimum down time. Semi-automatic hopper feed for continuous high production.

Perfectly balanced, match-ground knife sets are maintained by using a Hawker precision cutter knife grinder.

Demonstrations arranged in your plant—or let us refer you to a customer near you. Write for manual on the new Model 1000. The Hawker Manufacturing Division, East Dayton Tool & Die Co., 1425 Keowee Street, Dayton 4, Ohio.

HAWKER

MACHINE TOOLS FOR WOODWORKING

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No sag...and less cost

.....WITH *Wabash*

HARDWOOD SLIDES

TO PUT more sales appeal into your tables at lower cost and with fewer production headaches, use Wabash Hardwood Slides.

Carefully built, these Hardwood Slides are as good as the best ... yet often are priced lower. They are quiet and smooth in operation. Tongues are shaped to put a crown in the slide when it is extended ... to prevent sag!

FREE ENGINEERING SERVICE

Planning new tables? Send construction specifications to us. We'll plan extensions for greatest economy at no cost to you.

And for your non-dividing base tables, use Wabash Equalizer Slides for greatest sales appeal.

Walter of Wabash

B. WALTER & CO., Inc., WABASH, INDIANA

SLIDES • HARDWARE • DROP LEAF SUPPORTS

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Binks Schedule Fall and Winter Spray School

The tuition-free spray painting school operated by Binks Manufacturing Company, Chicago, Illinois, has set the following class dates for the 1960 Fall and Winter session: September 12-16; October 3-7; November 7-11 and December 5-9.

Conducted by Jack Adams, Binks' Director of Customer Research, the school will cover all aspects of spray painting, including the latest developments in spray equipment systems and automatic spray controls.

The school will be open upon application to all industry, with no tuition fee attached. Classes will be limited to approximately 25 persons, for optimum teaching conditions. Each class session will last five days.

For more information and registration forms, write Binks Manufacturing Company, 3114 Carroll Ave., Chicago 12, Illinois.

Northeast Ohio Appoints Sales Manager

Wm. K. Stamets, Jr., President and General Manager of Northeast Ohio Machine Builders, Inc., announces the appointment of Charles D. Shickley as Manager of Technical Sales for the Engineering firm. Shickley will supervise sales of machinery for the metalworking and woodworking industries. He has had wide engineering experience in both the ferrous and non-ferrous fields.

Pilot Plant To Produce New Fiber Board

Start of construction of a pilot plant near Redding, California, to produce a new type of fiber board has been announced by Gene C. Brewer, president of United States Plywood, and Donald D. Smith, president of Sheetwood Products Co. of San Francisco. This plant will be operated as a joint venture of United States Plywood and Sheetwood Products Co., which has done basic research on the product.

Production of the board, a combination of resins and wood fiber, will be limited to quantities suf-

ficient for market testing through a selected number of United States Plywood's 125 sales warehouses. Production is scheduled to begin in the Fall.

The new medium-density board, which has outstanding weathering properties is aimed at the residential home building market as a sheathing-siding material. It has exceptional smoothness, provides an excellent paint surface and is lower in cost than many existing siding products.

The new fiber board will be manufactured from available wood waste. Adhesive for the board is derived from sulphite liquor, a waste product from the manufacture of wood pulp. The new plant will be part of United States Plywood's Shasta Division, a highly integrated 8-plant operation in Northern California producing fir and pine plywood, lumber, box shook and particle board.

NHLA Graduates 50 From Inspection School

The graduation exercises of the 25th Class of our Inspection Training School were held in the Hotel Peabody, Memphis, Tenn., Thursday, July 14, with a capacity crowd on hand to witness the awarding of certificates to the 50 men who had successfully completed the intensive five months training period. Most of the men left with jobs awaiting them. The few who were not definitely spoken for were considering several openings from members in various parts of the country. Applications are being accepted for the 26th class which will start September 1.

Study Physical Properties Of Particle Board

A study concerned with the physical properties of particle boards and instrumentation to measure these properties is now under way at the State University College of Forestry at Syracuse University, Syracuse, N.Y.

To finance the eleven-month project, The Borden Chemical Company of Bainbridge, N.Y. and New York City has granted the College of Forestry $2500 for fundamental research on particle boards, a comparatively new type of commercial forest product. Dr. Edwin C. Jahn, associate dean, physical sciences and research, made the announcement of this industry-sponsored fellowship at the college.

The project is being directed by Prof. Alfred H. Bishop, associate professor of wood products engineering. Appointed as The Borden Chemical Company Fellow is Fortunato I. Stanziale of 112 Haven Rd., Syracuse. He is a candidate for a Master of Science degree in wood products engineering at the Forestry College.

Beautiful seamless legs, tapered or square, in satin brass, coppertone, pewter, chrome and plastic finishes, 3" to 28" long.

Every leg slim, seamless, strong—Beautiful lines and finishes of Wilkenson Legs add eye appeal to your furniture . . . fit in with any home decor. (Seamed legs also available at economy prices.)

All finishes rigidly tested under 80-hour salt spray—Finishes will not mar, stain, chip, corrode, peel or tarnish.

Wide variety of brackets, flanges—Legs also sold with weld-on flanges. Combination brackets permit straight or slanted positioning of legs. New self-leveling glides allow up to 1" adjustments in height.

WRITE TODAY for catalog, prices and samples to fit your specific needs. We also make legs, brackets and ferrules to your blueprints.

WILKENSON MANUFACTURING COMPANY

2916 West Lake Street Chicago 12, Illinois

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"So what else is good about them?"

It's not enough to tell you Jewel Brand Abrasive Belts are "fast cutting, cool running, and long lasting". They *are* . . . but the best way to prove *all* their advantages is on the job. Give them a "show me" run soon!

JEWEL

COATED ABRASIVES

Belts • Rolls • Sheets • Discs • Specialties

ABRASIVE PRODUCTS, INC.

South Braintree 85, Massachusetts

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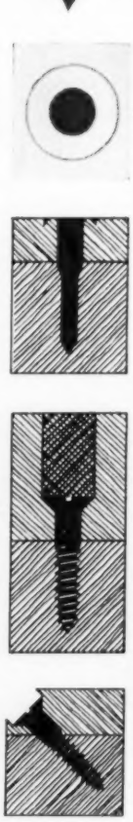
AMAZING NEW PRECISION TOOL

perfectly prepares wood for screws

Called the successor to ordinary countersinking devices, Circle • sink is the new precision tool for preparing every kind of wood perfectly for driving screws . . . flush . . . counterbored . . . or angle-driven. The unique patented design of Circle • sink makes it almost impossible to mar or splinter the wood surface . . . even with fussy plywoods . . . thereby minimize finishing. It is the perfect screw pilot for all who require precision results. Secret of why Circle • sink does what no ordinary countersink can do is its outside cutting edges which score the wood surface to the exact diameter of the screwhead without removing any material below the screwhead. (See diagrams) Thus, as the screw is driven, wood under screwhead is compressed downward providing much greater clamping power than is possible when wood under screwhead is removed by countersinking. No other tool approaches quality of work produced. Currently available in 20 sizes—6, 8, 10 and 12 screws. Write for comprehensive technical literature and details of our 30 DAY TRIAL OFFER.



TWO CIRCLE • SINK COMPANION TOOLS

No Mar Depth Stops for precision repetitive work. Ball Bearing Action.

Circle • sink Plug Cutters produce satin-smooth plugs which precisely fit Circle • sink holes.

Circle • sink®

U. S. Patent No. 2,927,614
Others Pending

NORFOLK PRODUCTS CORP., NORFOLK, CONN.

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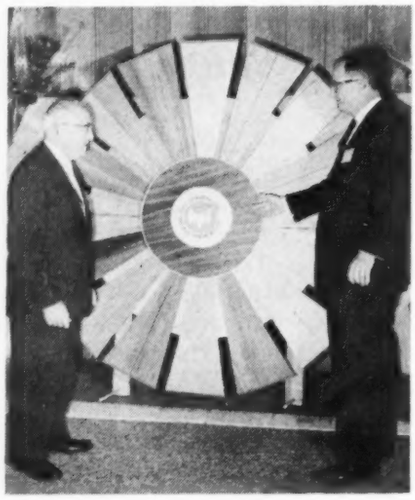
H.P.I. Color Wheel of American Hardwood Plywood



Left to right, E. Gurvitch, E. Gurvitch Lumber Company, Inc., 4 Exchange Street, Chicopee, Massachusetts looks at the Hardwood Plywood Institute's color wheel of American made hardwood plywood at the recent National Plywood Distributors Association's 18th Annual Convention at Sun Valley, Idaho with Clark E. McDonald, Managing Director, Hardwood Plywood Institute.

American made hardwood plywood on the color wheel includes the following: Benge, Birch, Butternut, Cherry, Cypress, Elm, Hackberry, Korina, Magnolia, Philippine Mahogany, Sycamore, Teak, and Walnut.

"Wait'll I tell Charlie about these!"

That's how it is with Jewel Brand Abrasive Belts. One satisfied user spreads the word about their superior grinding, smoothing and polishing performance and *bingo* . . . we've gained another valued customer! They're *that* good. Try some and see.

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Belts • Rolls • Sheets • Discs • Specialties

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Industrial Plywood Forms New Subsidiary

Announcement was made today of the formation of a new subsidiary, Technoply Corporation, by Bernard Hewitt, Chairman of Industrial Plywood Company, Inc., Jamaica, New York. Technoply Corporation, Hewitt stated, will make architectural grades of plywood and special laminations, including fireproofed and special building code wall materials.

The new subsidiary, which will be in operation in September in Industrial's new "Plywood City" 100,000 square foot plant in Jamaica, will also serve as a new product development center and will manufacture Panel Gems, Industrial Plywood's new melamine plastic-and-plywood laminated ¼ inch, grooved wall board.

To head the new subsidiary, Hewitt announced the appointment of two Vice-Presidents: Alexis D. Andreff, Vice-President Sales and Product Development, and Merrill A. Shea, Vice-President, Production.

Industrial Plywood's new 100,000 square foot plant—Plywood City—is designed to meet the specialized and individual needs of architects and builders. Plywood City will afford the architect and/or builder the opportunity to choose from a huge variety of plywoods and supervise from the very start the manufacture of large custom orders of architectural plywood.

"New York is recognized as the architectural center of the world. We feel that it is therefore fitting that New York should have a place easily accessible where architects can go for their special building code and fireproofing architectural wall board needs," said Hewitt.

Hawaiian Woods and Sawmilling

Two new reports, one describing the sawmilling industry in Hawaii and the other giving the properties of five native Hawaiian woods, are among new or revised reports recently issued by the U.S. Forest Products Laboratory, Madison, Wisconsin.

In Report 2190, "Factors Influencing an Expanded Sawmilling Industry for Hawaii," some of the problems involving logging operations in Hawaii are analyzed. In it certain factors are examined that are expected to influence the development of sawmilling there. The report also contains suggestions for equipment, plant layout, and related items that may be best suited to handle Hawaiian timbers.

Another report, entitled "Physical, Mechanical, and Other Properties of Five Hawaiian Woods," Report 2191, presents the results of research involving strength and related properties of five species, Ohio, Eucalyptus, Shamel Ash, Australian Red Cedar, and Redwood, that grow in Hawaii. The report also contains results of an exploratory study of the veneer slicing and drying characteristics of Ohio and Eucalyptus.

Name Washington, D.C. Manager of WCLA

Edwin O. Thompson, 46, a 29-year veteran in the lumber industry, today was named Washington, D.C., manager of the West Coast Lumbermen's Association and the West Coast Lumber Inspection Bureau office. He succeeds the late Cecil A. Luce who was Washington manager for 15 years.

Thompson's appointment was announced by H. V. Simpson, executive vice president of the lumber association and manager of the inspection bureau, who said Thompson was exceptionally well qualified to represent the west coast industry in the nation's capitol.

"Don't tell me you forgot to order more?"

The inconvenience of running out of Jewel Brand Abrasive Belts is more than offset by the prompt service we offer on hurry-up orders. However, just to be safe, stockpile a reserve supply today.

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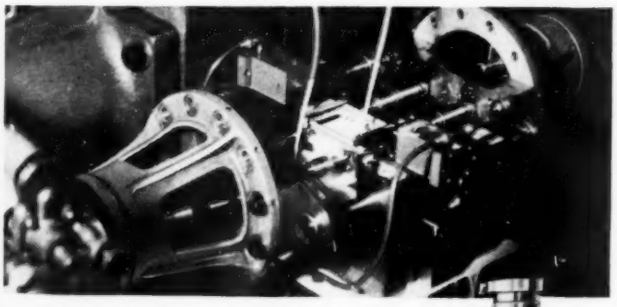
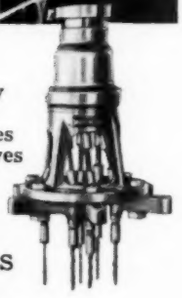
PAID FOR THEMSELVES

on the first job





MULTI-DRILLS are self-liquidating adjustable multiple spindle drill press attachments for production drilling. They multiply the speed, efficiency and production of men and machines many times over. They can quickly pay for themselves —often in the first week of operation. MULTI-DRILLS are available in many models designed to drill from 2 to 15 holes (and more) at one stroke of a drill press. Thousands of MULTI-DRILLS in use today are proving that you can save time and money by multiple drilling with a Commander Adjustable MULTI-DRILL. Ask your nearby Commander Distributor to show you how a MULTI-DRILL can reduce your hole costs.

Write for the Production Tool Catalog today.

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Commander MFG. CO.

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See us at Booth No. 321, Production Engineering Show, Chicago, Navy Pier

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SAVE ON

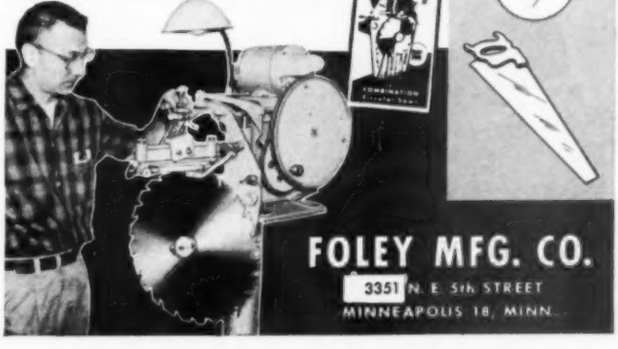
SAW SHARPENING

If it costs you $25.00 or more a month, let your monthly sharpening bill pay for a FOLEY SAW FILER.

What is your monthly saw sharpening bill? Are you paying $25.00 a month or more, or sharpening saws by hand, or probably using them when too dull? If so, a Foley Saw Filer will soon pay for itself in your plant. With the Model 200 Foley Automatic Saw Filer you can sharpen both "combination" and crosscut circular saws, band saws and hand saws. No experience needed to turn out precision sharpening with a Foley. Increase your sawing production, improve your work quality, prolong the life of your saws—and let your monthly sharpening bill pay for the Foley.

30-DAY TRIAL OFFER

You may try the new Model 200 Foley Saw Filer in your own shop for 30 days. Write for literature and details of 30-day trial offer.



FOLEY MFG. CO.

3351 N. E. 5th STREET

MINNEAPOLIS 18, MINN.

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Consider H. Willett Adds Farmington Line

Consider H. Willet, Inc., of Louisville has announced the availability of a complete new line of fine, solid Cherry home furniture. Called "Farmington", the new line was inspired by traditional furniture designs of the so-called Federal Period after the Revolutionary War.

The Farmington line has been re-scaled for modern living by Willett so it will blend beautifully in size and design with today's modern homes. It features a spiral twist motif on the legs of the items in the line reminiscent of the classic revival which took place in this country at the end of the 18th Century.

With stress placed on utility, the Farmington line boasts just enough decoration to lend the elegance necessary for livability and permanence. Constructed of the finest quality solid Cherry and crafted in the finest traditions of Willett workmanship, it provides the ultimate for homemakers who like Early American, yet want it with the modern touch.

Finishes in the new line mark a departure from the blood-red Cherry with which we have become so familiar. Rather it is a soft, medium-brown hue which resembles Walnut in appearance except for the predominance of the more beautiful Cherry-wood grain. Distressing is also used in the finish to provide a deep, rich appearance.

There are many marvelous MONTGOMERY products

• BLO-HOG-Rugged construction, low maintenance, built-in fan, —any combination of scrap with uniform hoggings. Ask for bulletin 24B59.

• NO CLINKER.

WE ENDORSE
NIXON AND LODGE

• BURN-RITE INCINERATOR—Water-jacketed—compact—approved—no smoke, flyash, collector, conveyor. Ask for leaflet 15H59.

• BLOW-RITE SYSTEMS for conveying all materials in any quantity.

All Montgomery products are guaranteed to do the job they are sold to do.

JACKSONVILLE BLOW PIPE CO.

P. O. Box 3687 Jacksonville, Florida ELgin 5-5671

QUALITY THROUGH EXPERIENCE • *Since 1925* • SOLVING DIFFICULT PROBLEMS FOR INDUSTRY

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TRADE MEETINGS

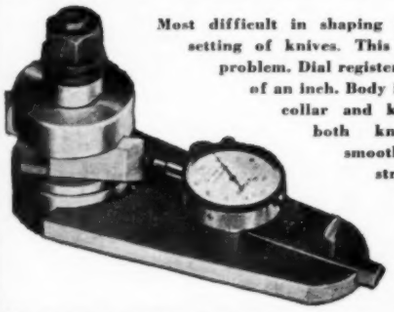
September

12	California Redwood Association 576 Sacramento Street San Francisco, California
14-16	Western Pine Association Multnomah Hotel Portland, Oregon
18-21	International Concatenated Order of Hoo-Hoo Hotel Arlington Hot Springs, Arkansas
19-21	Northern Sash & Door Jobbers Assn. Drake Hotel, Chicago, Illinois
19-23	American Ladder Institute Grove Park Inn Asheville, North Carolina
21-22	Northern Hardwood & Pine Manufacturers Association King's Gateway Hotel Land O'Lakes, Wisconsin

October

4-6	National Hardwood Lumber Association Sherman Hotel, Chicago, Ill.
17-19	American Forestry Association Edgewater Gulf Hotel Edgewater Park, Mississippi
19 22	Cabinet & Fixture Manufacturers Guild Phoenix, Arizona, (Hotel not indicated)
20-23	National Institute of Wood Kitchen Cabinets Grand Hotel, Point Clear, Ala.
23-25	Canadian Wood Development Council LeManoir Saint-Castin, Lac Beauport, P.Q., Canada
26-28	Pacific Logging Congress Hotel Vancouver Vancouver, B. C., Canada
27-28	Woodwork Institute of Calif. Sheraton Palace Hotel San Francisco, California

ACCURA SHAPER KNIFE GAUGE



Most difficult in shaping operations in accurate setting of knives. This new gauge solves the problem. Dial registers to one ten-thousandth of an inch. Body is placed against bottom collar and knives set accurately—both knives cut alike for smoother shaping and less strain on shaper spindle.

Price FOB Chicago, $34.50.

Write for Circulars

WOODWORKERS' TOOL WORKS
224 South Jefferson St. Chicago 6, Ill.

Use postpaid card. Circle No. 275

EDMONT CASE NO. 633: Strapping steel wire around boxes, $6.50 a dozen leather palm gloves lasted 2 shifts. No. 161 Super Werx gloves, of vinyl-impregnated fabric wore 8 shifts, reducing glove costs 73%.

New glove outwore leather 4 to 1

No. 161 Super Werx

Edmont JOB-FITTED **GLOVES**

In the case above, job-fitted gloves were able to save at least $4.74 on every dozen pairs. Edmont recommended the vinyl-*impregnated* Super Werx because this heavy duty version of the popular Werx glove is designed to replace ordinary leather for many operations. It resists abrasion, cuts, and snags, is sure-gripping and 100% washable. Super Werx also outwears 18 oz. cotton gloves 6 to 1.

Free Test Offer to Listed Firms: Tell us your operation. From more than 50 types in both coated and impregnated fabric we will recommend the correct glove and send samples for on-the-job testing.

EDMONT INC.
1246 Walnut Street, Coshocton, Ohio
Edmont Canada, Ltd., Cowansville, Que.

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Fast . . . versatile . . . power-packed!

STANLEY SABRE SAW

$59.50 includes 4 blades

EXTRA HEAVY DUTY

- 16% bigger motor—maintains speed under load!
- 3600 strokes per minute for faster cutting!
- Full ball- and needle-bearing construction!

Stanley's H76 Sabre Saw gives you NEW high power, more speed, more "beef" for every job. Complete with both flush cutting and NEW right-angle cutting blade! Ask your dealer to demonstrate this great saw. Also available: low-priced H75 Sabre Saw—$46.95.

STANLEY®

STANLEY ELECTRIC TOOLS
Div. of The Stanley Works
New Britain, Connecticut

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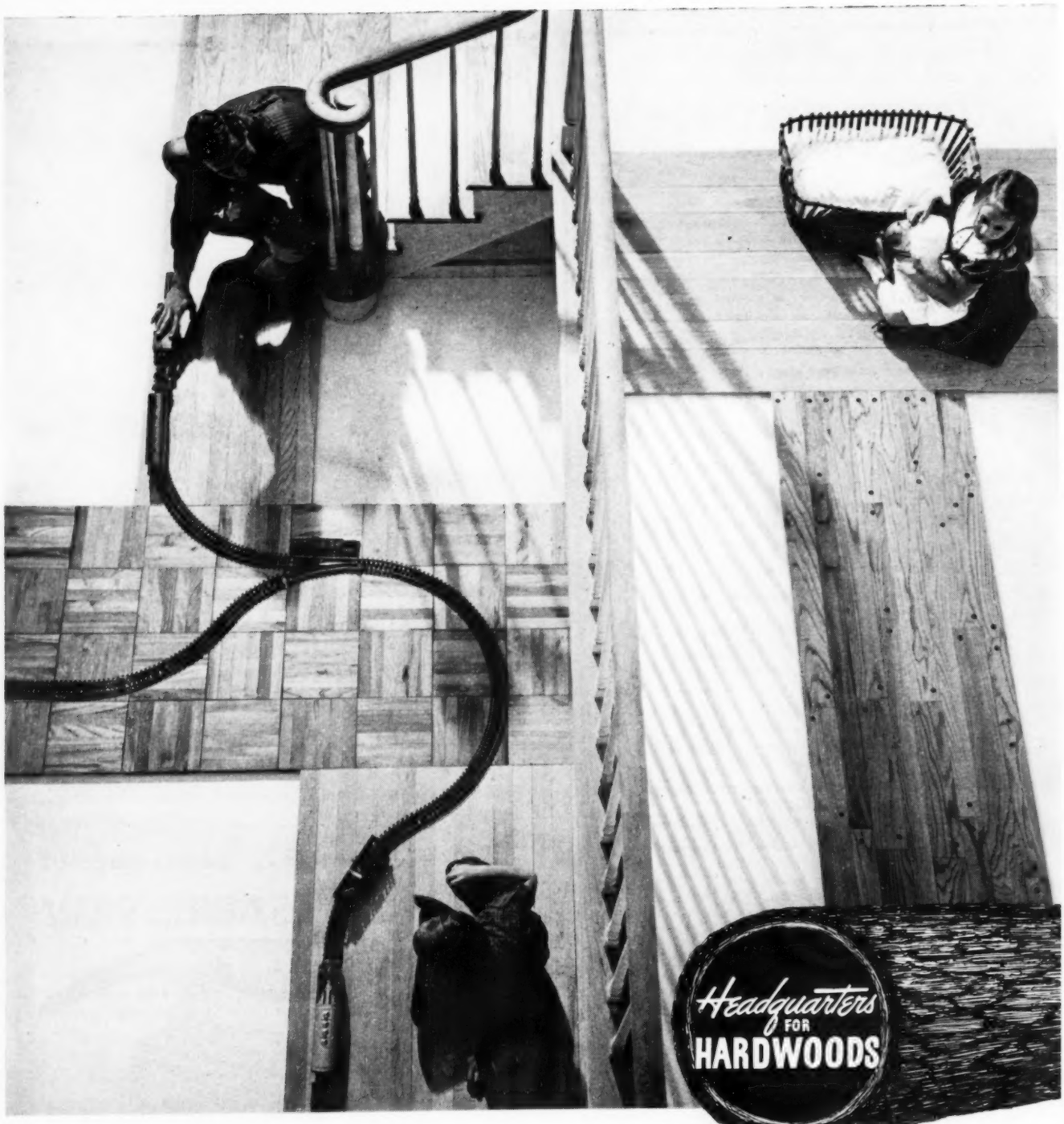

For a lifetime of beauty underfoot . . .

There's Nothing in the World Like WOOD!

And when better floors are built, you can be sure the flooring manufacturer turns to his "HEADQUARTERS for HARDWOODS" for his raw material.

The proof of this statement will be obvious when you receive your first delivery. ATLANTIC started in 1896 developing the know how which pays you dividends in proper grading, manufacture and seasoning.

You owe it to yourself to discuss your problems with your ATLANTIC MAN.

Call or write him today at Boston, Buffalo or Charlotte. You won't be sorry.

7th in a series

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Live, Work, Build Better with **wood**

The ATLANTIC *Lumber Company*

88 Broad Street, Boston 4, Mass.
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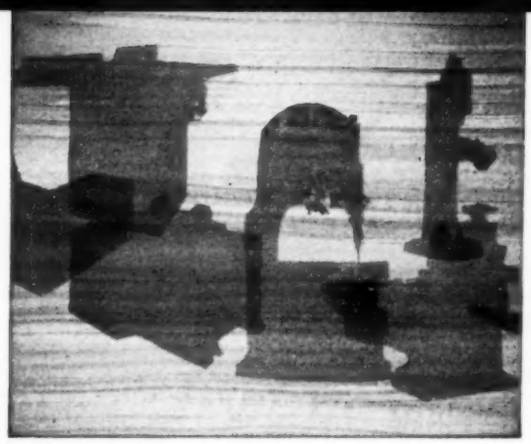


equipment and supplies

New Design Features Highlight 17-Ton Log Stacker

Improved 17-Ton Log Stacker

Four major design changes, developed to increase mill yard versatility of the 17-ton capacity series, have been announcd by R. G. LeTourneau. Increased fork length and demountable tusks permit handling of logs up to 7' wide. Packaged lumber and prestressed beams can also be easily handled.

Maneuverability has been improved by decreasing the turning radius from 25' to 20'. A diesel engine with 210 h.p. that drives the AC and DC generators now replaces the 195 h.p. engine previously used. The low counter-weight box designed for three point stabilization.

Manufacturer: R. G. LeTourneau, Inc., 299 S. MacArthur, Longview, Tex.

Use postpaid card. Circle No. 15

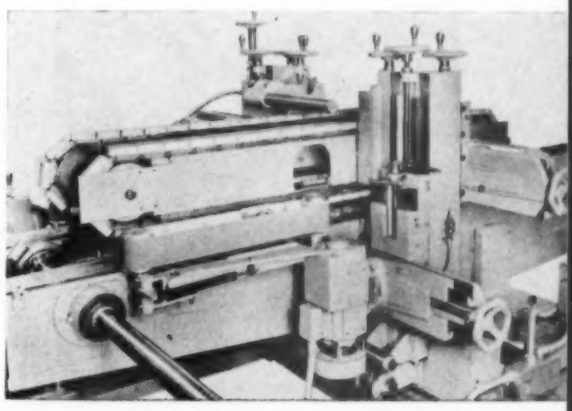
Announce Edge Belt Sanding Attachment

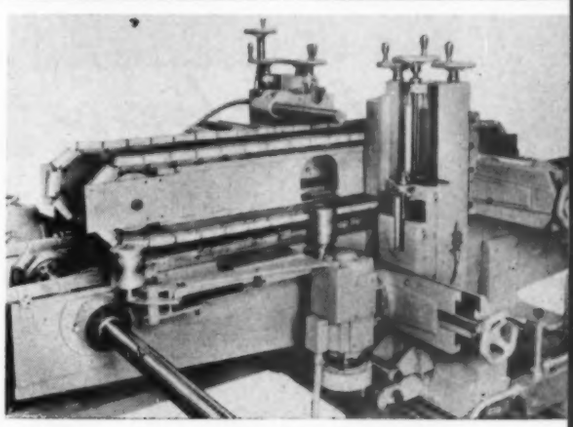
Development of an edge belt sanding attachment for their line of double-end cutoff saws has been announced by Mereen-Johnson Machine Co. A key feature of the edge belt sanding attachment is its versatility. Sanding belt and rubber drive pulley are quickly detachable to permit use of cope motor for conventional cope work.

The sanding attachment is an optional accessory on new machines, and is not adaptable to existing machines. To accommodate the attachment, chain beam and hold-downs are extended.

The attachment makes it possible to trim and edge-sand panels in one consolidated operation. Four models of Mereen-Johnson double-end cutoff saws and double-end tenoners can now be provided with the attachment.

Manufacturer: Mereen-Johnson Machine Co., 4401 Lyndale Ave., North, Minneapolis 12, Minnesota.





Shaper Provides Speed Choice From 3600 to 8500 RPM

New two-spindle shaper is being presented to the trade after a full year's testing on the production line. Of the many features of this precision-built machine, the ability to choose any speed between 3600 and 8500 rpm, its one-piece table and base, and its compactness, will appeal most to the operator, explains Dependable Machine Company.

Designed with operating ease in mind, shaper has all controls at fingertip location, yet maintains a high safety factor. Machine is well ribbed to insure complete rigidity. It is also priced to meet all similar types in this class equipment.

Manufacturer: Dependable Machine Co., Greensboro, North Carolina.

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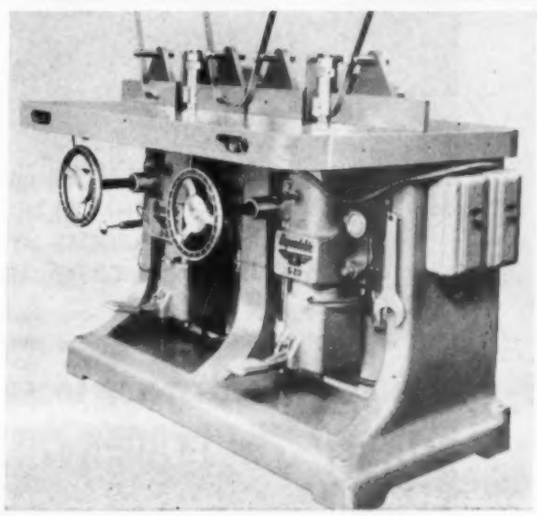
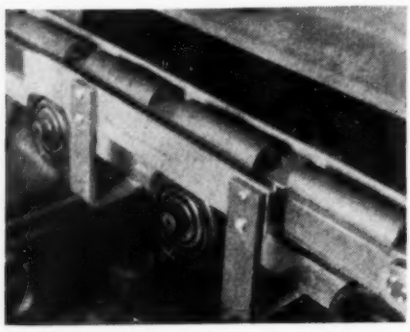


High-Speed Chain Return Carrier

A high-speed chain return carrier is announced by Jenkins Woodworking Machinery, Division of Kohler-Joa Corporation. The new carrier increases bushing, pin and sprocket life on feed chains of Jenkins double-end machines. Recommended for speeds above 100 f.p.m., the guided wheel carrier is designed to support cabins both with and without dogs at speeds up to 300 f.p.m.



Wear and load on all portions of the feed system are claimed to be significantly reduced by this frictionless return. Bearing the full weight of the chain between sprockets, the carrier is said to eliminate the shock load and wear on pins, bushings and sprockets by high speed resonant bounce.

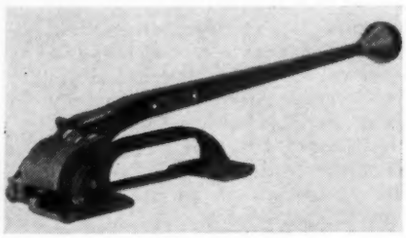
Similar rubber wheel return carriers also are offered on Jenkins Slat Bed multiple cutup machine for high speed operation.

Manufacturer: Jenkins Woodworking Machinery Div., Kohler-Joa Corp., Sheboygan Falls, Wis.

Use postpaid card. Circle No. 17

Unlimited Take Up Heavy-Duty Tensioner

The Signode Model TH Tensioner is a fast, manual action strapping tool, with self-energized feed wheel that holds high tension. Light weight (weighs 6 lbs) and easy to use it makes vertical or horizontal strapping easy. Takes strap sizes from ¾" x .028" to 1¼" x .050" waxed, painted or coated.



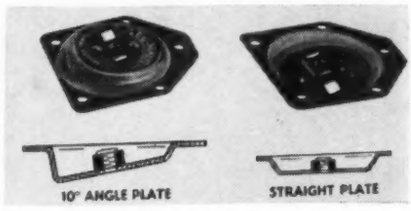
The tensioner takes strapping directly from the coil and saves a foot or more of strap every time it is used.

Manufacturer: Signode Steel Strapping Co., 2600 North Western Ave., Chicago 47, Ill.

Use postpaid card. Circle No. 18

New Leg Plate Designs

The plate will accept hanger bolt projection of full ⅜" instead of conventional ¼", giving 50% resistance to side stresses, the Barry New York Co. claims.



It is made of 16 gauge steel and is available in flat and 10° angle for 5/16" hanger bolts.

The plate includes a fully machined nut, permanently clinched in place, which prevents the nut from turning, or loosening.

Manufacturer: Barry New York, Inc., 227 Taaffe Place, Brooklyn 5, N.Y.

Use postpaid card. Circle No. 19

NEW HANCHETT ELECTRIC

Jockey GRINDER

MODEL E54 — FOR INSERTED TOOTH SAWS

SHARPENS SAW TEETH RIGHT ON THE MACHINE — PRODUCTION GOES UP SAW MAINTENANCE COSTS GO DOWN

Powerful ¼ H.P. motor with 4½" diameter wheel. Grinds teeth accurately and uniformly. For maximum cutting efficiency!

ALSO MODEL E55 FOR EDGER SAWS

HANCHETT MANUFACTURING CO.

MAIN OFFICE BIG RAPIDS, MICH. WEST COAST PORTLAND 1, OREGON

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INDUSTRON HAS IT!

HIGH FREQUENCY!

ONE MAN SIDE FEED ELECTRONIC EDGE GLUERS

A Proven . . . High Performance . . . one man gluing operation with a minimum of labor and space. This is what owning an Industron Model E Side Feed Electronic Edge Gluer can do for your operation. "HIGH FREQUENCY POWER" in combination with the specially designed "one man in the center" INDUSTRON EDGE GLUER is the secret of the high efficiency and large production you can expect with an Industron machine.

WRITE TODAY for full information on how you can reduce overhead and increase production through Industron's High Frequency know-how.

INDUSTRON CORPORATION

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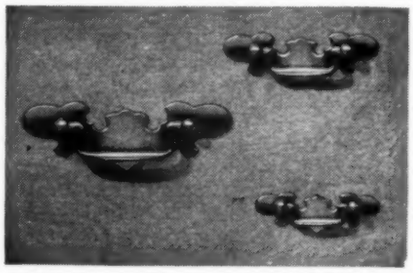
Use postpaid card. Circle No. 234

New Early American Pulls By National Lock

The Furniture Trim Division of National Lock Company has added two smaller Early American pulls. They are Georgian, Colonial, or early American decor, on chests, breakfronts, desks, and other fine pieces.



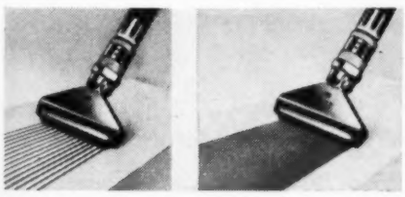
The pulls are sized for 2", 2½", and 3½" centers. Catalog numbers, respectively are 63-3302, 63-3303, and 63-3282. Available in Antique English finish, the pulls have wrought steel backplate and bail.

Manufacturer: Furniture Trim Division, National Lock Co., 1902 7th St., Rockford, Ill.

Use postpaid card. Circle No. 20

Glue Gun Cuts Cost

The John P. Fox Company announces a new dual purpose, roller-type glue gun, which they claim will cut glue costs up to 83%, yet insures faster, better bonding regardless of machine speed. The saving is due to the exclusive multiple-bead pattern of adhesive laid down by the gun.



All models are designed for both machine or manual use, and can be installed on existing equipment. Quick change roller-tips permit guns to be reset in seconds for different striping widths. Air pressure adjustment for ribbon coating.

Manufacturer: John P. Fox Company, Inc., 1107 South Mountain, Monrovia, Calif.

Use postpaid card. Circle No. 21

Multi-Purpose Electric Cleaner

A combination blower and cleaner designed to remove particles of sawdust and shavings from hard-to-reach places are described in a 4-page bulletin from Ace-Sycamore, Inc., 448 DeKalb Ave., Sycamore, Ill.

The cleaner is available in five sizes 1-1/3, 3/4, 1/2, and 1/3 h.p. with a fifth size identified as a "Hot and Cold" blower for rapid removal of moisture.

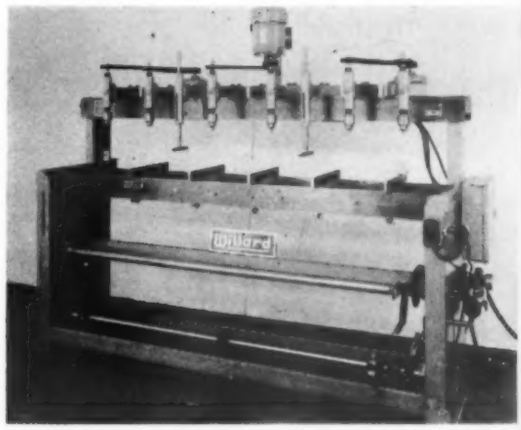
It can be used to clean shelves, ceilings, walls, floors, woodworking machinery, etc. A Sam Browne Belt facilitates carrying the unit from the shoulder.

Use postpaid card. Circle No. 22

Economy Series Of Vertical Type Boring Machines Announced

A new member of the Williard line of multiple spindle drilling and boring machines has been announced by the Kramer Machine Co. To be known as the "Scotsman Series," the machines are basically the same as the Williard Deluxe Models but with feed to and from the drills manually-controlled by a foot valve. Front panels and tray are omitted and the electricals are minimal and of the manual type.

Rate of feed to the spindles is infinitely adjustable over a wide range via a speed control valve. A depth stop limits the feed stroke to any depth up to 4".



The machines handle up to 14 average-duty spindles, either individually or dual-powered, up to 2 hp per spindle.

Manufacturer: The Kramer Machine Co., 27 Seeley St., Lake City, Pa.

Use postpaid card. Circle No. 23

Get More From Wood Waste....

...MORE HEAT, more economy, if you burn it

...MORE PROFIT, lower costs, if you sell it

WILLIAMS "No-Nife" HOGS

When used for fuel, wood scrap reduced to chips in a Williams Hog produces maximum heat . . . burns evenly . . . won't restrict flow of air . . . keeps smoke at a minimum. Handling costs are reduced as much as 75%!

When processed for sale as particle board chips, or as sawdust or wood flour, a Williams Hog produces a better quality, more uniform product . . . increases output . . . requires less labor . . . keeps power and maintenance costs low.

Automatic installations for handling wood waste show exceptional savings or profits.

Ask for brochure.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
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CRUSHERS GRINDERS SHREDDERS
OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

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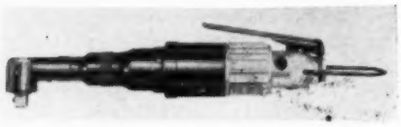
Fastening Tools With Adjustable Clutches

Buckeye Tools Corporation announces two new series of 90° angle-head fastening tools for air-powered nutrunning and screwdriving with adjustable clutches for closer torque regulation.



They were designed for continuous industrial operation where clearance is limited to ½" offset. The tools feature a spring-loaded clutch with torque output adjusted by a tamper-proof hex nut on the clutch assembly.

Available in speeds ranging from 600 to 3500 r.p.m. the tools are built in both reversible and non-reversible models and carry ratings up to ¼" machine screw. The maximum weight is 1¾ lbs., with a maximum size of 9⅝" long by 2" diameter. These work spindles are available: ¼" female hex, plain and magnetic, and ¼" and ⅜" square drive.

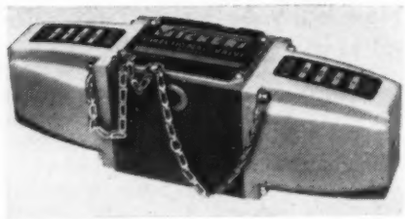
Sturdy all-steel angle-head assembly includes separate gears and pinions for quick, economical replacement when required. Tools can be converted from nut runner to screwdriver by replacing the work spindle.

Manufacturer: Buckeye Tools Corp., 5003 Springboro Pike, Dayton 1, Ohio.

Use postpaid card. Circle No. 24

New 8 GPM 4-way Directional Control Valve

A new solenoid operated 4-way directional control valve has been announced by Vickers Incorporated. The unit offers unusual compactness and versatility for the many directional control requirements of hydraulic machinery.



The valve has a nominal rating of 8 g.p.m. and can handle flows up to 12 g.p.m. without malfunction. For its size, the unit has the highest flow capacity, at reasonable pressure drops, of any valve available. Sub-plates are furnished with ⅜" ports, or with ½" ports to take advantage of the larger flows. Maximum recommended operating pressure is 3000 p.s.i. Valves are rated for 115 volt, 50 or 60 cycle a-c service.

The valve incorporates improved air-cooled solenoids which are retained in their cover rather than being mounted separately. In addition to quiet and cool operation, shockfree performance is assured through superior cushioning. From the standpoint of endurance, the solenoids have several times the life of any air-cooled solenoids of this type now on the market.

The same valve also is available with oil-immersed solenoids.

Manufacturer: Vickers Incorporated, Division of Sperry Rand Corporation, Detroit 32, Michigan.

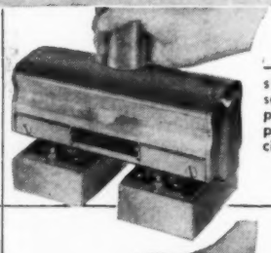
Use postpaid card. Circle No. 25

Portable air and electric

Sanders

for production and maintenance work

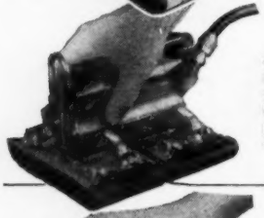
Model OS-800 — lighest weight orbital air sander on the market, at only 3 lb., packs the power and speed needed for production jobs.



Model 600 — heavy-duty, straight-line air sander for sanding, pumice rubbing, or polishing, 1100 oscillations per minute.

Model OS-700 — single-pad orbital air sander, weighing 5 lb., operates over 6000 cycles per minute.

Model 4000 — straight-line, two-pad air sander with longer, slower stroke, 2100 oscillations per minute, 9 lbs.



Model 1000 — straight-line air sander with big abrasive area, operates at 2500 oscillations per minute, palm lever control, 7½ lb.

Model OE-900 — electric — heavy duty, high torque, constant speed. Not damaged by overload. No belts, gears or brushes.

Model SP-101 — straight-line, single-pad air sander, 3000 oscillations per minute, 5 lbs.

ASK FOR BULLETINS...
Specify models in which you are interested.

All air sanders suitable for wet or dry sanding; electric sander for dry work only.

SUNDSTRAND

SUNDSTRAND SANDERS

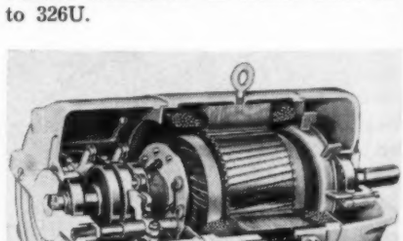
SUNDSTRAND MACHINE TOOL • Belvidere, Illinois

Division of SUNDSTRAND CORPORATION

Use postpaid card. Circle No. 283

Redesigned Wound Rotor Motors

The Louis Allis Co. has announced the availability of a new line of redesigned Wound Rotor Motors to meet NEMA Standards in frame sizes 213 to 326U.



Some of the features of these motors are: reduction in size and weight, cast iron housing, end bracket construction with oversize grease reservoirs, and dynamic balancing for vibrationless operation. Rotor end coils are banded with an epoxy fiberglas to remove end coil shorts due to wire cutting insulation.

These motors are suited for elevators, cranes, or hoists, and can be furnished with open, drip-proof, or totally enclosed, non-ventilated enclosures for horizontal, ceiling or sidewall mounting.
Manufacturer: The Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.

Use postpaid card. Circle No. 26

New Work Light With Duplex Outlet Base

A low cost, flexible arm Localite featuring a duplex outlet base has been announced by Fostoria Corporation. The heavy-duty lamp is especially suitable for rolling tool cabinets or for repair, assembly and inspection benches where soldering irons, glue pots, small power tools and other electrical equipment must be plugged in.

The light can be clamped to work benches or it can be attached to any surface by drilling mounting holes through the outlet box. An 18" high-quality steel flexible arm permits positioning of the light as desired.

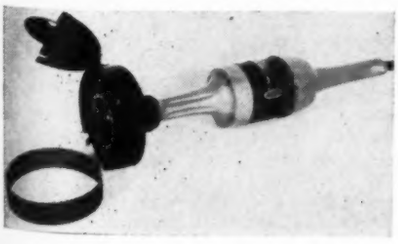
The reflector is fabricated of heavy stamped steel in one piece and accommodates A-21 lamps with medium screw base in sizes from 15 through 100 watts. The new light is supplied in standard vista green baked enamel finish.
Manufacturer: Fostoria Corp., 1200 North Main St., Dept. 52, Fostoria, Ohio.

Use postpaid card. Circle No. 27

New Type Abrasive Wheel

A new solid rubber grinding wheel for use with a coated abrasive belt is available from the Thor Power Tool Co.

Available under the trade name "Mermac," the new type wheel fits directly on the spindle of the grinder. Abrasive belts in desired grits can be slipped over the wheel to give it an abrasive perimeter. Under operation, the belts are held by centrifugal expansion of the rubber wheel, without any mechanical locking devices or backstand arrangements.

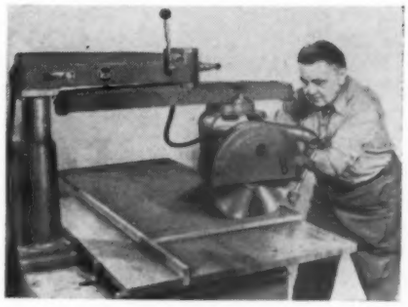


The abrasive bands are self-cleaning and combined with the Thor air grinders are ideal for flat work and weld grinding.
Manufacturer: Thor Power Tool Co., 175 N. State St., Aurora, Ill.

Use postpaid card. Circle No. 28

Long Arm Radial Saw Increases Capacity

A new "long arm" radial saw, with increased capacity that provides faster, more accurate cutting and lower production costs, has been introduced by Rockwell Manufacturing Company's Delta Power Tool Division.



The Delta 12-14" radial arm saw can cross-cut 1" stock, 24" with a maximum rip capacity of 36" and a maximum depth of 4⅜". The dado capacity is 10" x 1½" wide. They claim the power

Cutting LONG and NARROW Grooves with BADGER GROOVER DISCS...

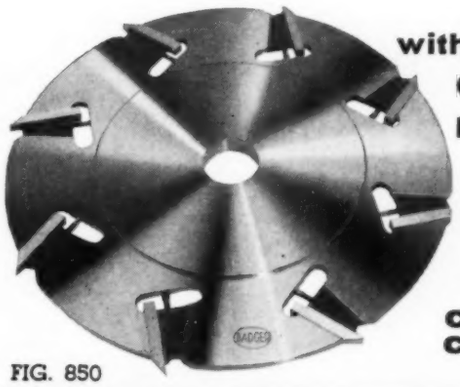
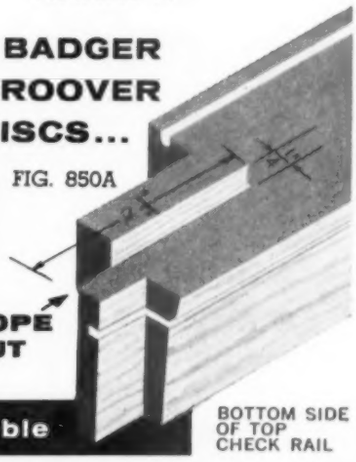


FIG. 850

FIG. 850A



reinforced to eliminate wobble

BOTTOM SIDE OF TOP CHECK RAIL

When you want to make a deep, narrow cut like this cope cut on a double end tenoner, BADGER Type "GD" Groover Discs do a superior job. The thin 3/16" body width in the disc in Fig. 850 is reinforced with a 6" diameter hub on both sides of the 10½" cutting circle disc to eliminate any tendency to wobble. Cuts of this type are typical in the manufacture of sash parts and dimension stock.

BADGER Groover Discs come in several styles. The Type "GD" shown is equipped with High Speed Steel Corrugated Back Thin Knives — easily ground-to-pattern and relatively inexpensive to replace. This type particularly recommended for simple patterns and shorter runs.

The Type "GDL" Disc has the pattern milled into the face and requires no grinding to maintain the pattern throughout the life of the cutters. They are bevel sharpened only and set out occasionally to maintain the original cutting circle. For the utmost in precision and for long production runs, the Type "GDL" is particularly suitable.

Carbide tipped cutters are available for either the Type "GD" or "GDL" Discs for cutting through glue lines, plastics, laminated or synthetic hardboards of all types.

Groover Discs have many advantages over saws. They are easy to maintain and reset to keep the original cutting circle. The high speed steel or carbide tipped knives give long life and clean cuts. The **ground** corrugations on BADGER knives insure precision alignment and quick adjustment.

If you are interested in PRODUCTION wood machining with the least long-range cutter expense, why not check your layouts with BADGER engineers? Free engineering counsel available.

WISCONSIN KNIFE WORKS
BELOIT, WISCONSIN
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BADGER

Send for *Free* Cope & Tenon Head Bulletin #590.

NAME_____
FIRM_____
ADDRESS_____
CITY_____ STATE_____

Engineers to the Woodworking Industry

Use postpaid card. Circle No. 284

packed two, three or five h.p. motor will stand up under extra heavy work loads over a long haul.

Delta's saw was designed for use in the shop, on the job site, for maintenance or production line work in industrial plants, etc.

Manufacturer: Rockwell Manufacturing Co., Delta Power Tool Div., 474 N. Lexington Ave., Pittsburgh 8, Pa.

Use postpaid card. Circle No. 29

Two New Low Cost Drivers From Skil

Positive clutch drive delivers powerful torque and stays engaged as long as pressure is applied by the operator. Provides power screwdriving and nut-running at a minimum investment. When desired tightening is obtained, operator simply lifts driver and clutch immediately disengages. Clutch does not re-engage until driver is applied to next fastener.

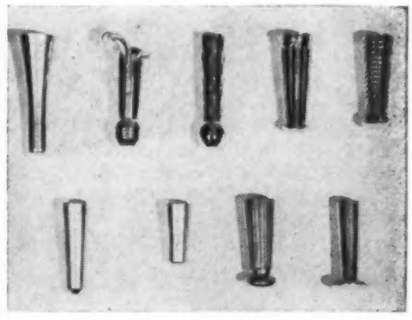
Both models have a trigger switch, pin for locking in "on" position, die case aluminum housing, quick change finder, ball thrust and sleeve bearings. Model 140 has a reversing switch mounted on top for fast disassembly work. They have capacity for No. 10 wood and self-tapping screws and No. 12 machine screws and nuts.

Model 139 and reversing model 140 are built for light to heavy production use and are claimed to be excellent for use wherever power fastening can speed up work and cut costs because of their low cost.

Manufacturer. Skil Corp., 5033 Elston Ave., Chicago 30, Ill.

Use postpaid card. Circle No. 30

Wilkenson Adds 9 New Ferrules



Wilkenson has added 9 new ferrules to its greatly expanded line of legs, glides, ferrules and brackets. They are styled and finished for furniture of practically any design. The ferrules are available in several finishes including satin brass, chrome, and gold plating.

Manufacturer: Wilkenson Mfg., Co., 2918 West Lake St., Chicago 12, Ill.

Use postpaid card. Circle No. 31

BOICE-CRANE
6-INCH STROKE SANDER-FINISHER

NEW—4,000 sfm Speed using Optional Aluminum Drums

NEW—Optional auxiliary worktable

NEW—Machine tool type base

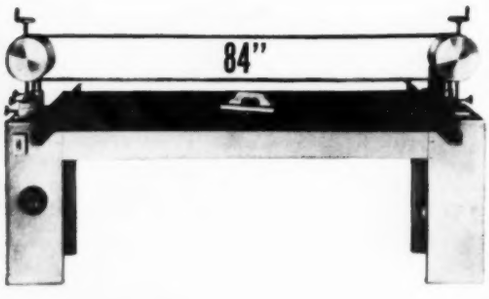
NEW—Floating motor mount

NEW—Free-rolling Worktable 28" x 84" (also available 18" x 60")

NEW—Anti-friction bearings

NEW—Faster stock removal

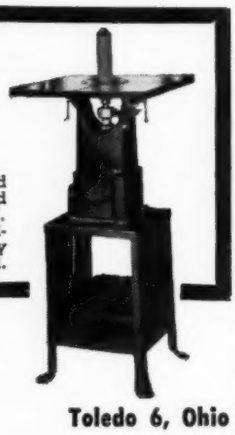
NEW—Optional dust-collection system



Imparts high finish to wood or metal, large or small flat pieces. Use 10" dia. drums to sand contours. Saves rejects by removing stock a lot or a little at a time, from a large area or a tiny spot. Operator views results constantly without turning the piece. Capacity: Areas 29" wide x 60" long or 36" wide x 84" long, 0 to 4" thick. No length limit on stock narrower than 6". Strip moulding details finished in one operation. Effective belt tracking controls. Enclosed motors. Drive-belt fully guarded.

The First LOW COST Precision Oscillating Spindle SANDER-GRINDER

—to utilize abrasive sleeves from ¼" dia. to 3". Rapidly and accurately sands wood, grinds metal and plastics internally and externally. Ideal for scroll-grill work, or contours small as ¼". Bevels angles to 45°. Table 20" x 20", tilts 2 ways. Spindle oscillates 7/8" at 83 s.p.m. Taper-shank arbors install instantly into taper-socket type main spindle. Ball-bearing. Gears run in oil.



BOICE CRANE POWER TOOLS

Write for complete information

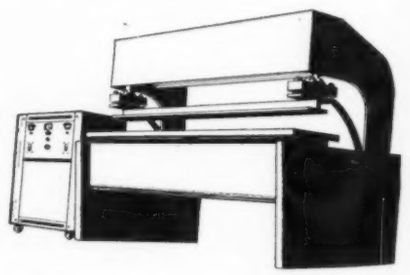
BOICE-CRANE COMPANY

931 W. Central Avenue **Toledo 6, Ohio**

Use postpaid card. Circle No. 285

New Generator and Press Combination

Weldotron announces a new small high-frequency generator and press combination. They were designed to handle both long and short productions of core gluing, banding, scarfing, etc.



The generator and press combinations are specifically designed to perform various operations which can easily be changed from day to day.

Generator has 3KW output and the press has an 8' maximum electrode

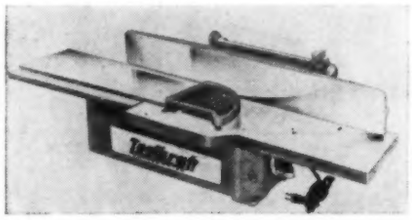
length with a 5' space between supports. Other press features are a 12" throat and automatic timing.

Manufacturer: Weldotron Corp., 841 Frelinghuysen Ave., Newark 12, N.J.

Use postpaid card. Circle No. 32

Toolkraft's New 6" Long-Bed Jointer With Built-in Motor

This jointer incorporates Toolkraft's exclusive parallel motion—which means a constant distance between blades and table at all depths of cut for clean, smooth surfaces. A built-in ¾ h.p. General Electric motor supplies efficient power.



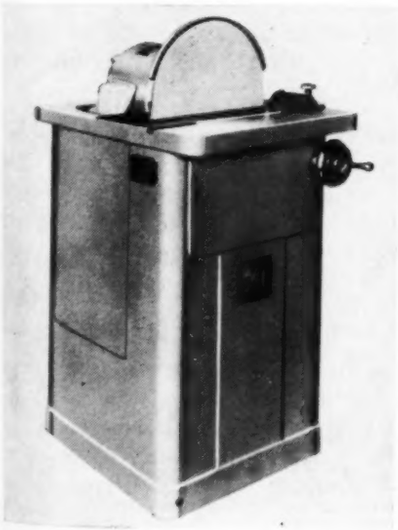
The jointer has a maximum cut of 6" wide and ½" deep. Front and rear tables are 9" wide with a 3" rabbeting ledge. The fence guide is 4¾" high and 33½" long. It has a spring-loaded index pin which automatically locks at 45°-0°-45°. Other features are: cast steel surface, safety guard for the blade, and an extra large table size 43-9/16" long.

Manufacturer: Toolkraft Corp., 700 Plainfield St., Springfield, Mass.

Use postpaid card. Circle No. 33

14" Tilting Disc Sander For Wood, Plastic Or Metal

Features formerly found only in larger, heavy-duty equipment are now incorporated in the new Yates-American 14" Tilt-Disc sander. Rugged design provides rigidity and power for producing accurate, quality finishes on wood, plastic, or metal.



The major feature of this new sander is the unitized tilting disc assembly which combines the direct motor drive, sanding disc, and safety guard, allowing use of a stationary work table. The work table remains flat and level, eliminating awkward work handling on a tilted surface. Heavy workpieces are easier to hold in position.

The wrap-around stationary table provides for easy, accurate finishing of curved or irregular shaped workpieces. It is 20¾" wide, with 9½" edge-to-disc depth, 3" beyond the disc on each side and wrap-around surface 5⅛" x 3⅝" behind the disc.

Precision adjustment within the wide range of disc tilt from 15° forward to 45° back is quickly made with the handwheel located in the front of the machine. Degree of tilt is indicated on graduated scale and handwheel setting is set by locking knob.

The sander is available with either ½ hp, ¾ hp or 1 hp motor for practical application from light to heavy wood or for plastic sanding or even heavy abrasive work on metals.

Manufacturer: Yates-American Machine Co., Beloit, Wis.

Use postpaid card. Circle No. 34

MONITE WATERPROOF GLUE CO.

Monite Bldg. 1628 N. 2, Minneapolis 11, Minn., U.S.A.

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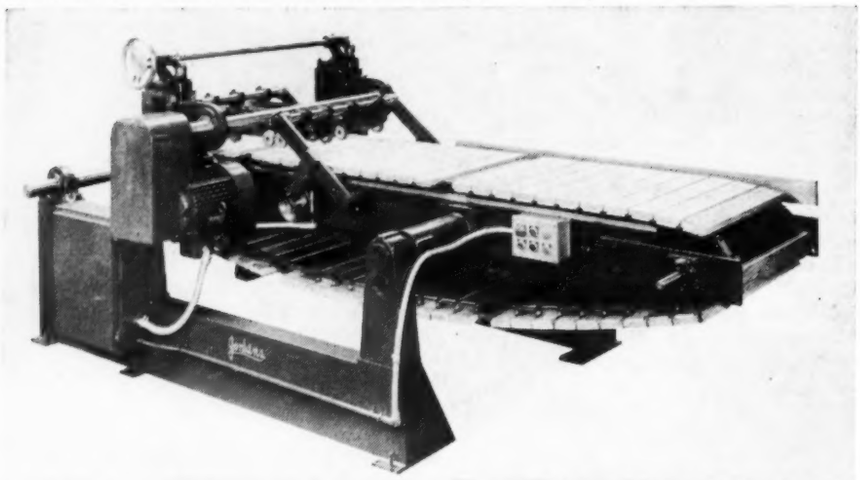
"Tenoner" Accurate Slat Bed Multiple Cut-Up Machine



Rugged construction, simple setup, "tenoner" accuracy and a low-budget price tag are features of New Jenkins 140 Series Slat Bed Multiple Cutup Machine.

Available in bed widths up to 96" and bed lengths up to 72" before holddowns, the 140 Slat Bed uses heavy-duty Jenkins Oilomatic piston-type solid-block chain with half-round laminated plastic bearing under every link running in half-round bearing bronze tracks.

The new Slat Bed which can carry up to 20 hp. on the dado shaft, has individually spring-loaded, rubber-covered, holddown wheels mounted on adjustable parallelogram frame, infinitely variable feed drive.

Manufacturer: Kohler-Joa Corp., Sheboygan, Wis.

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PRE-FINISHING

Kinetic-Kurtain
COATERS

produce high quality finishes at speeds up to 450 feet per minute

Here's how to increase finishing speeds tremendously! And get beautiful, smooth, metered paint films as well, thanks to *Gasway's* Kinetic Kurtain Coater, the newest concept in panel finishing. Saves dollars and increases production for people who finish metals, plywoods, particle and paper boards, furniture and many other items.

The user benefits from finishes held to very close thicknesses, fast color changes with completely interchangeable color systems, precisely repeatable adjustments, and instantaneous precision curtain for high speed. With the Kinetic Kurtain Coater, you get virtually 100% paint efficiency.

These benefits mean ultra-modern, high speed finishing which cuts costs dramatically and improves finished quality.

Gasway Kinetic Kurtain Coaters at work at the Kroehler Furniture production line in Louisville. Sealer coats are being applied, followed by ground coat and clear finish after painting.

INCREASES PRODUCTION
SAVES MATERIAL COSTS

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New folder gives all pertinent details on sizes, capacities, specifications and dimensions. Write for your complete information folder today.

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- 100% *repeatable* adjustments
- Fast color changes
- Smooth, precisely metered paint film
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Appointments

Rovsek To American Hardboard Association

Frank J. Rovsek who has been appointed Assistant Executive Secretary of the American Hardboard Association, Chicago, will work closely with the Association's executive secretary, Donald Linvill, in the coordination of the group's recently-announced Plus Values advertising and public relations program.

Prior to this appointment, Rovsek was Executive Secretary of the Forest Products Research Society in Madison, Wisconsin. He assumed his new duties August 1.

Chamber Post To Doyle

Mortimer B. Doyle, executive vice president of the National Lumber Manufacturers' Association, has been appointed to the Association Committee of the Chamber of Commerce of the United States.

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. . . the 1960-61 Edition

Hitchcock's WOOD WORKING Directory

Just off the press . . . the new edition of the wood working industry's only *complete buyers guide*. A hard-covered, 8½" x 11½", 328 page book containing . . .

- **A COMPLETE PRODUCTS INDEX**
  . . . listing names and addresses of all known suppliers of the nearly 1000 products used in woodworking.
- **TRADE NAMES LISTINGS**
  . . . to make possible location of supplies when only product trade name is known.
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Wheaton, Illinois

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Title_____

Company_____

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City_____ State_____

Doyle's appointment—for a one-year term—was announced by Arthur H. "Red" Motley, National Chamber President and publisher of PARADE PUBLICATIONS.

As an Association Committee member, Doyle joins select company with forty association executives and leaders representing a wide range of business and industry.

Crown Zellerbach Appoints Research Vice President

Crown Zellerbach's Board of Directors has approved a major realignment of the Corporation's research functions, including the establishment of the new position of vice president for research and development.

To fill the new post, the Board has elected Dr. W. M. Hearon, who has been general manager of the company's Chemical Products Division. Dr. Hearon will move to corporate headquarters in San Francisco. He will retain his present responsibility for the operation of the Chemical Products Division.

TITAN High Speed HANGER BOLT DRIVER

- **TIMED IN SECONDS!**
  This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. It is not necessary to stop rotation at any time.

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Patented. Has such a large adjustment range, made possible by a new all-thread main ring, that most common stud projection heights can be secured with only one gage.

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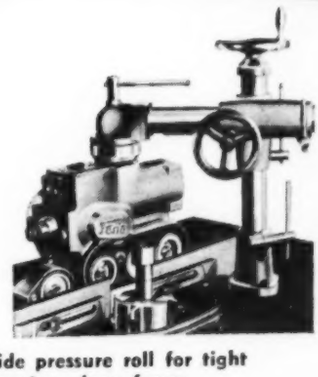

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80
120
ft. p. min.

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- **Compact, powerful, precision-built unit**
- **Gear-box and motor totally enclosed**

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U. S. Plywood Appoints New Director of Public Relations

Fred Isley has been appointed public relations director of United States Plywood Corporation, S. W. Antoville, board chairman and chief executive officer, has announced.

"We have been billed for a long time as the world's largest plywood organization," said Antoville.

"Such growth calls for increased public understanding of our firm and its products."

Southern Pine Lumber Company Names Four New Division Vice-Presidents

At its regular mid-summer meeting of its Board of Directors, July 28, Southern Pine Lumber Company created four new division vice-presidents, according to Arthur Temple, Jr., President.

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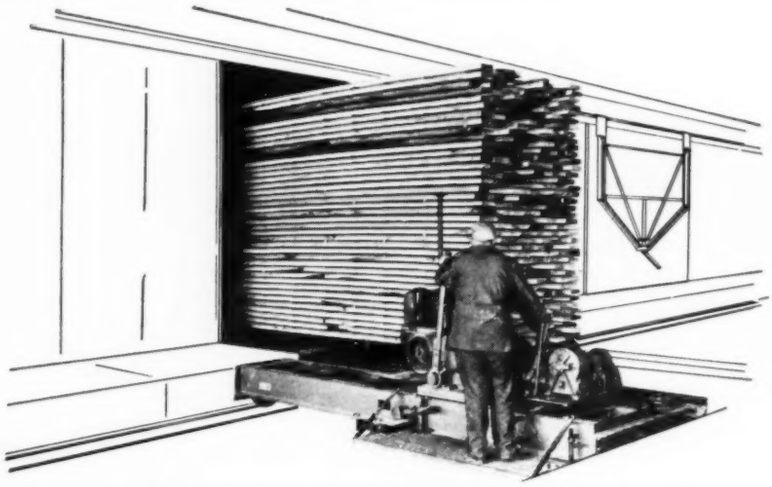

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The Leitelt Power Transfer Car, operated by one man, can move load after load of lumber at lowest operating cost to you. It will move your kiln loads of lumber dependably and efficiently in and out of storage tracks . . . charge and discharge your dry-kilns and deliver loads to your first line machine. Extra man-power is eliminated. Leitelt will gladly answer inquiries on how a Leitelt Transfer Car can serve your particular needs.

LEITELT IRON WORKS
Since 1862
400 MILL ST.
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Southern Pine Lumber Vice-Presidents (Continued)

The new officers are Clyde Thompson, vice-president of the Forest Harvest Division; Kenneth Nelson, vice-president for Land & Timber; Joe Carter Denman, vice-president for Lumber Products and Carrol Allen, vice-president for Fiber Products.

The new promotions are made necessary by the continued expansion and intensification of Southern Pine's operation, it was stated, making it necessary to enlarge the responsibilities of key division heads.

D. C. McNair, vice-president for Retail is the only other division vice-president, making a total of five.

Carrol Allen

Clyde Thompson

Joe Carter Denman

Kenneth Nelson

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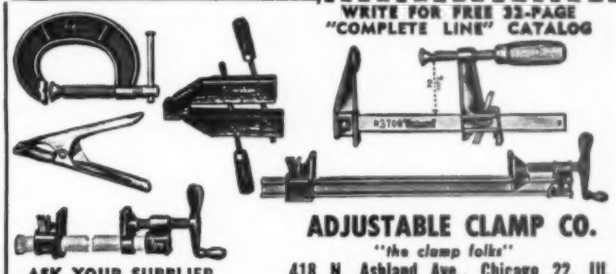

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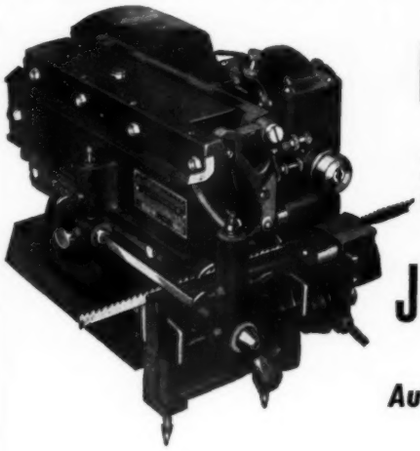

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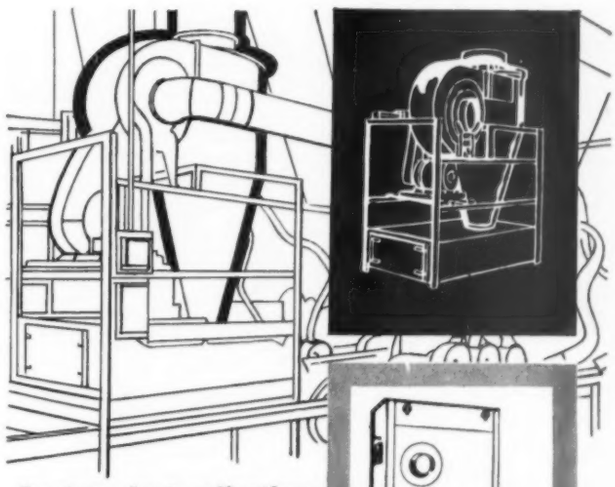

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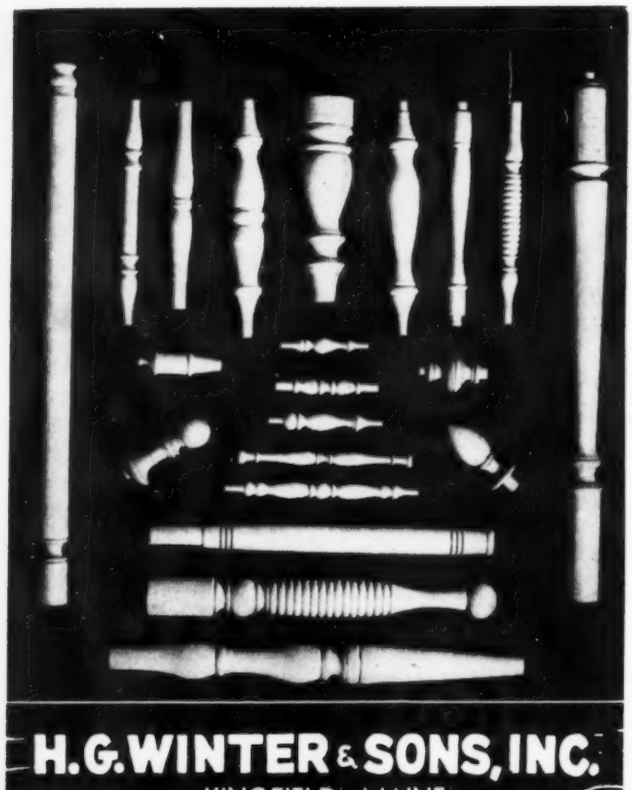

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LOOKING AHEAD WITH HITCHCOCK

Here are some of the editorial features scheduled for the coming months.

The Why and How of Woodworking Machinery Leasing
A personal interview with Robert Sheridan, President, Nationwide Leasing, Chicago, Ill.

Bowater Board Co.—New Dry Process Hardboard Can Be Tailored To Your Needs
Part II of the Bowater story gives you more of the facts from John G. Robinson, Plant Manager, plus a very complete plant tour and production story.

Flexibility Fills The Gap
Learn how one progressive manufacturer producing grandfather clocks has met and can meet both its own needs and customer demands with flexibility in production.

Gold Ply From the Mother Lode
Here is the story on how the Pickering Lumber Corporation profits from its new plywood plant.

Double-End Tenoner—Most Versatile Woodworker
Part IV tells what is happening to the double-end tenoner and how it will meet the demands of the woodworking industry.

Gluing Problems and Answers
This column originally scheduled for the September issue has been shifted ahead to October. Send us your gluing questions and **Sticky Joe** will answer them for you.

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SUPREME BAND SAWS cut faster . . . have increased cutting capacity with minimum breakage! Present day high speed equipment demands Supreme Saws. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness . . . to stay sharp! There is a Supreme Band Saw for every industry . . . for every material. Special purpose saws are made to order.

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Borers, Greenlee No. 370—5 Ft. 6 Spdle. Horiz. DMD
Borers, McKnight 88C, Chucking DMD
Borers, Moak & Pryble 2 spdle, horiz.
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Clamps, Black Bros. 40 Sect. 8 Ft. Cat. 5 Clamps sec.
Clamps, Lancaster No. 100C Case
Clippers, Coe 88" bd and motor
Dovetailers, Dodds 10-15 & 20 Spdles
End Matchers, Yates E1 pb, bd.
Frequency Changers, 75, DMD 30 KW
Glue Jointer, Yates No. 213 & Jenkins 343-A, bb, dmd.
Glue Spreaders, Francis 12" Sgl. Roll, V-drive
Glue Spreader, Union 48" dbl. rubber rolls. dmd.
Grinder, Buffalo 76" knife dmd.
Jointers, New Moak 12", bb, dmd.
Jointers, 8" and 16", 24" & 30" & 12"
Lathes, Mattison 57D vee & motor
Lathes, Whitney back-knife, BB, V-drive
Mortiser, New Britain No. 7 bd. & motor
Mortiser, W & M No. 284 Sgl. Spdle. bb, dmd.
Moulders, Amer. No. 35—10" BB, DMD
Moulders, Hermance 12" BB. BD & Motor
Moulders, Mattison No. 226—12" elec. dmd.
Moulders, Vonnegut 12" elec. bb, dmd.
Planers, Berlin 36" round belt dmd.
Planers, Buss No. 4—30" single bb, dmd.
Planer, Buss 30" dbl. bb, v-belt & motors.
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Planers, Whitney 32A—30" Sgl. bb, dmd.
Planers, Whitney No. 32—24" Sgl. Surfacer bb, dmd.
Planers, Y-A No. 186, dbl. 20" DMD.
Planers, Yates No. 177 30" dbl. bb, dmd.
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Sanders, Oliver Scroll, DMD.
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Sanders, Nash No. 25—10 spdle. dmd.
Sanders, Nash No. 24—6 Spdle. DMD.
Sanders, Niagara brush, bb, dmd.
Sanders, Oakley, Drawer, MD.
Sanders, F & E 60" 3-drum roll feed, dmd.
Sander, W & M No. 171 belt bb, dmd.
Sanders, Yates 84 Edge belt bb, dmd.
Saws, Yates-Amer. No. 67 Chain Fd Str. Line bb, dmd.
Saws, Beach dbl. cutoff, bb, dmd, 78" x 3ft.
Saws, Oliver Variety T.A. bb, dmd.
Saws, F&E No. 500 & Amer. No. 10 Variety T.T. bb, dmd.
Saws, Amer. No. 10 and F & E No. 500 T. Table Variety saws, bb, dmd.
Saws, Y-Amer. G77 Str. Line Rip bb, dmd.
Saws, Diehl No. 55 Str. Line bb, dmd.
Saws, Mattison No. 207—bb, dmd.
Saws, New Delta 12" tilting arbor dmd.
Saws, New Delta Radial
Saws, Wilkins-C No. 87 dbl. cut-off saw, 60"x100", BB DMD
Shapers, Whitney No. 389, double bb, dmd.
Shapers, Whitney Dbl. Spdle, MD BB
Shapers, New Moak single spindle, bb, dmd.
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Band Saw; 36 in Buss with Mtr. $175
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Moulders & Stickers—Fay & Egan 10", No. 209 and No. 189; Hermance 12"; XL Moulder
Planers—Jossia-Ross 24" 2-knife single; American 27" single; Whitney 26"; Greaves-Klusman 24"
Planer-Matchers—Fay & Egan 6-6-6 Jr., Fay & Egan No. 415
Planer-Matcher-Moulders—Newman 8-B; Fay & Egan No. 969
Rod & Dowel Pointers—Bignell; Fay & Egan No. 7 Rod
Sanders—Yates No. 401 3-drum; Yates No. 431 30" 3-drum endless bed; 18" single disc; Skilsaw hand belt
Saws—double cut-off; spur, chain, and self-feed rip; combination and variety; swing cut-off
Shapers—Fay & Egan No. 552 and No. 952 single; American No. 1 single; American No. 30 dbl.; Buss dbl., Whitney dbl., Gallmeyer-Livingston dbl., Sidney "Famous"
Tenoners—Greenlee No. 553; Fay & Egan No. 505
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Sander, Jefferson hand block, belt
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Sander, Yates-Americans S-333, 49", endless bed
Sander, Timesaver 50" top
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Saw, Mattison No. 202 straight line rip
Saw, Oliver No. 88-D tilting arbor, table
Saw, Yates-American B-89 tilting arbor
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Yates-American 43" No. 431 direct motor driven 3-drum endless bed sander
Yates-American 31" No. 413 direct motor driven 2-drum endless bed sander
Yates-American 43" type S23 direct motor driven roll feed sander

SAWS

Yates-American No. GG-3 direct motor driven ball bearing roller table double cut-off saw
Yates Type F-25 variety saw
Yates-American G44 straight line cut-off saw

SHAPERS

Greenlee 180B belted motor driven high speed ball bearing shaper
Onsrud No. W125 auto. shaper
Whitney No. 282 single spindle electric shaper
Whitney No. 234 electric double spindle shaper
2—Whitney No. 134 double spindle electric ball bearing shapers
Whitney Latest Model No. 299 Single Spindle Auto. Shaper

TENONERS

American No. 1 single end tenoner
Fay & Egan No. 505 electric single end tenoner
Greenlee No. 545 ball bearing double end tenoner
Mereen-Johnson Practically New with No. 300 Panel Sizer with Copes
Wilkin-Challoner No. 620 electric panel sizer with copes

VENEER MACHINERY

Dennis Model 3 taping machine
Francis 84" motor driven double roll resinous glue spreader
Taylor Glue Spreader for Panel Flow
Black Bros. 62" No. 22D double roll resinous glue jointer
Union 60" motor driven double roll resinous glue spreader

MISCELLANEOUS

Diehl No. 77 Waterfall grooving machine
2—Porter spindle carvers
Plycor continuous-feed lumber edge gluing machine

Sutton WOODWORKING MACHINE CO.
PHONE CYpress 9-5851 SEDGEFIELD INN GREENSBORO, N.C.

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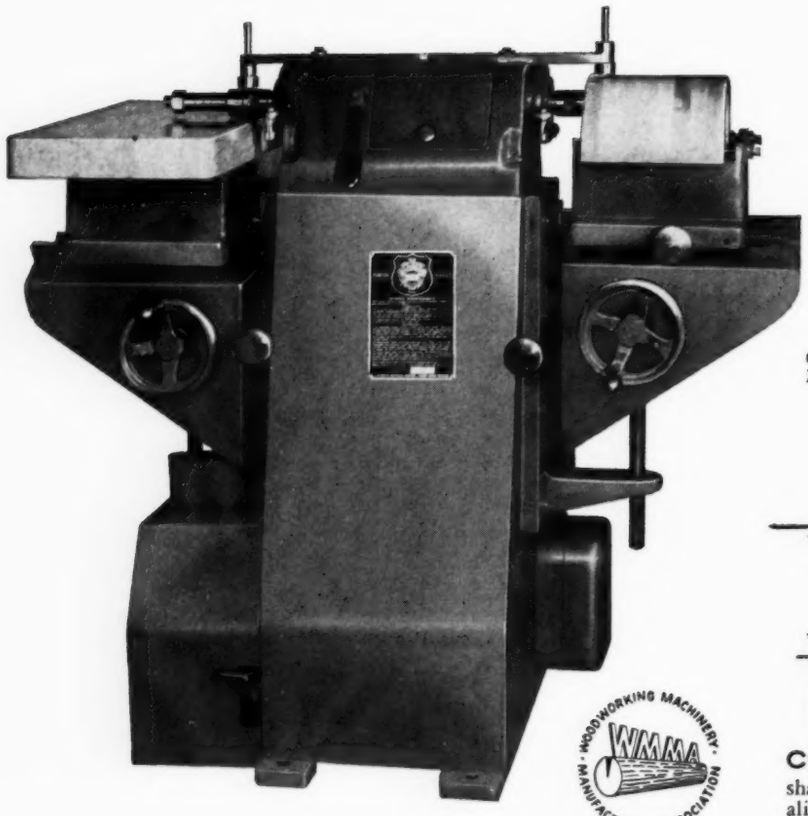

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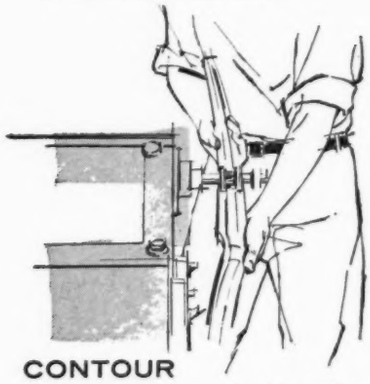

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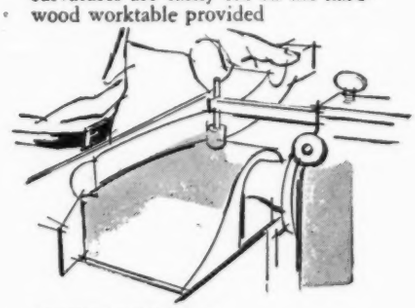

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Street .....

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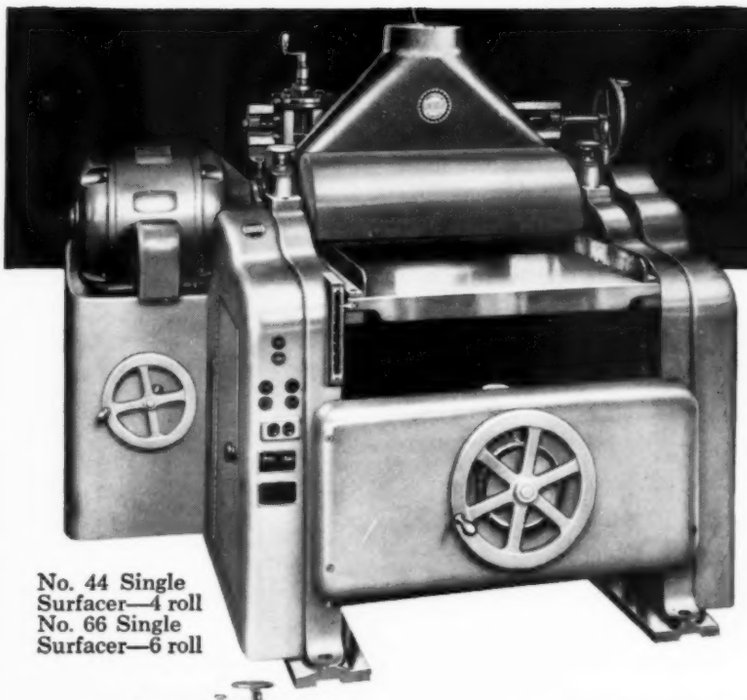
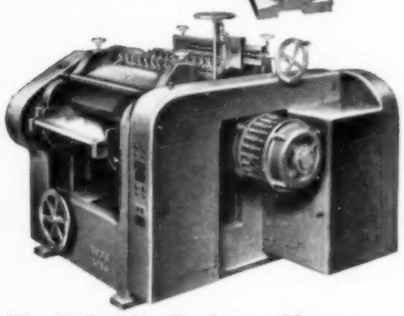


No. 44 Single Surfacer—4 roll
No. 66 Single Surfacer—6 roll

THE COMPLETE PLANER LINE

with profit-producing advantages

PRECISION BUSS PLANERS

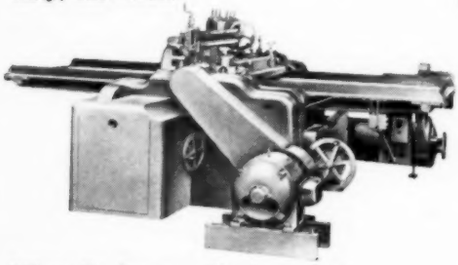


No. 55 Double Surfacer—Heavy duty, fast feed.

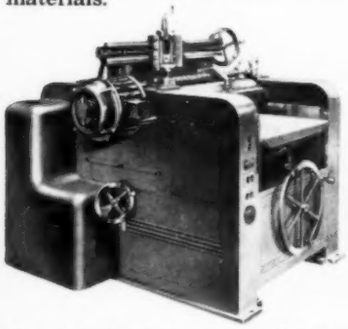
For nearly a century Buss has been known as the designer and producer of the world's most accurate and durable planers. A planer specialist, Buss devotes 100% of its time to the engineering and production of surfacing equipment. When you are looking for a planer, compare Buss with any make. We think you will decide on Buss . . . the planer with the profit-producing advantages. Let us send you literature on our complete line . . . six different models, forty different sizes.

Check these BUSS advantages

- ✓ Instantaneous Control For Parallel Setting Of Pressure Bar
- ✓ Patented Shearing Bar Prevents Damage To Cutterhead And Pressure Bar
- ✓ Micrometer Control Of Lower Rolls At The Turn Of A Dial
- ✓ Up To 1,000 Lbs. More Frame Weight For Rigid Support, Improved Performance, Longer Life

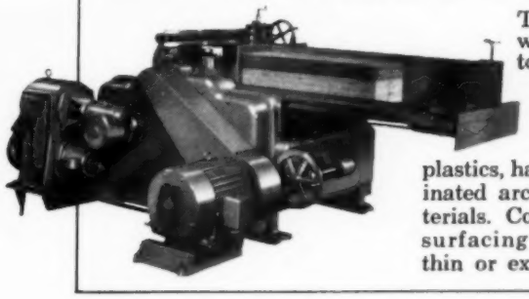


Micro-Surfacer — Single surface machine for planing thin, flexible materials.



No. 4-L Single Surfacer—Wedge adjusted bed, 4 roll.

BUSS SPECIALIZED PRODUCTION SURFACING EQUIPMENT



Top Head Single Planer with chain drag hopper feed to four power rolls.

Buss has designed planers for rubber, vinyl, phenolic, acetate, plastics, hardboard, brake lining, laminated arches, and many other materials. Contact us about any special surfacing problems involving very thin or extremely thick materials.

BUSS MACHINE WORKS, INC.

A Subsidiary of Greenlee Bros. & Co.

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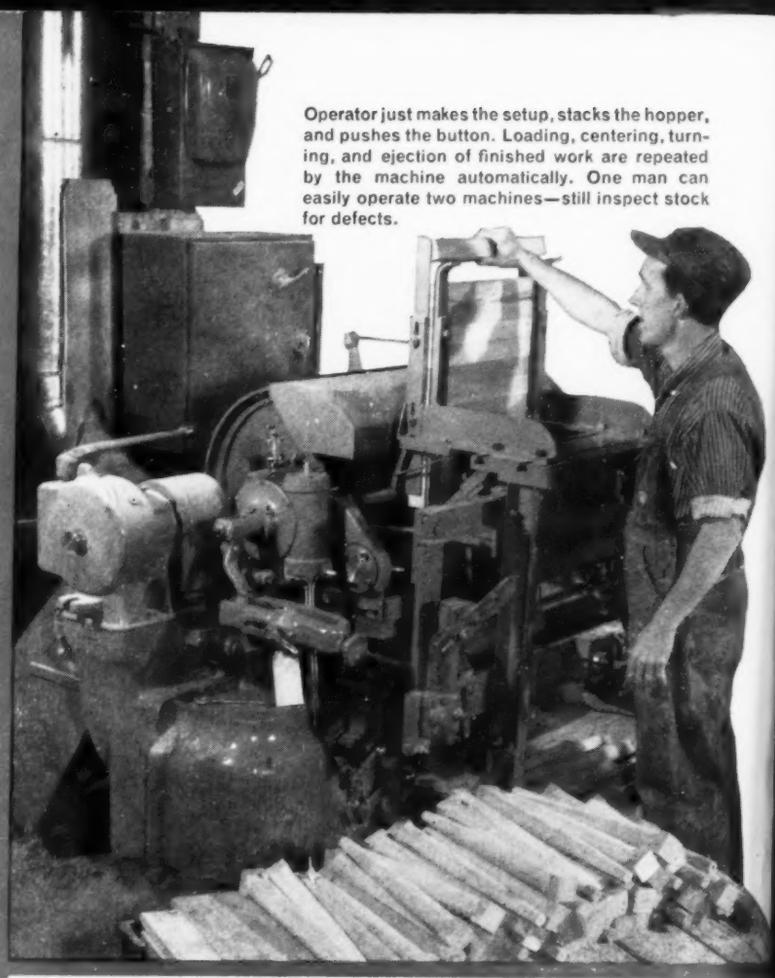
UP TO 500% MORE PRODUCTION ON MATTISON "66" AUTOMATIC SHAPING LATHE



Operator just makes the setup, stacks the hopper, and pushes the button. Loading, centering, turning, and ejection of finished work are repeated by the machine automatically. One man can easily operate two machines—still inspect stock for defects.

"Our Mattison No. 66 shaping lathe is giving us 3 to 5 times more production than our old lathe, depending upon the type of turning and kind of wood used. We're extremely pleased with the quality of turnings, as well as the increase in production."

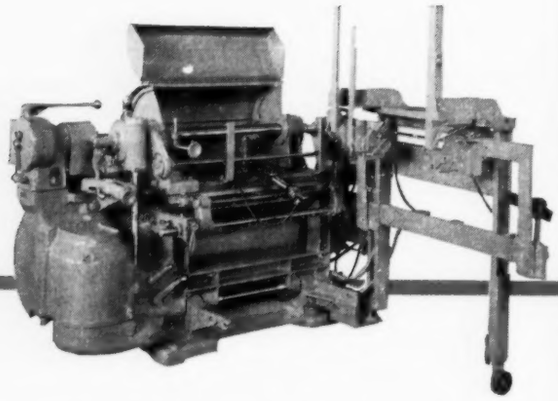
H. L. Moore, president, Home Chair Co., Ronda, N. C., echoes the same satisfaction voiced by many woodworking companies as they watch air power automatically operate the tailstock, carriage, and steadyrest on their Mattison No. 66 shaping lathes.

Automatic loading, centering, turning, and ejection of finished work form a direct chain to lower production costs on a wide variety of sizes and shapes for both hard and soft woods. Easily adjustable to any required production rate, the Mattison "66" cuts costs with automatic turning of stock from $\frac{3}{4}$" to 4" square and up to 30" long.

Automatic cutter retraction increases knife life

The new Mattison "66" also saves money through less downtime, because the knives stay sharp longer. Says Mr. Moore, "Our experience has been that the knives stand up from 20% to 25% longer because the cutters are automatically removed from the stock as soon as the turning is completed. There's no excessive rubbing to dull the knives."

If turning is part of your woodworking operation, chances are pretty good that a new Mattison "66" can pay for itself quickly in your plant, too. Your Mattison dealer can arrange a demonstration at the factory or in a "Mattison-equipped" plant near you. Contact him now for an appointment.



Electrically operated hopper feeding attachment is hinged, can be swung outward to give unobstructed access to knives for whetting, touching up, or setting.

MATTISON
MACHINE WORKS
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MATTISON

WOODWORKING MACHINERY

"Built better . . . to produce better quality"

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